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*Bidirectional Converter Simulink Model Matlab*

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## LAWRENCE FAULKNER

### DC—DC Converters for Future Renewable Energy Systems Springer

This is the first book in a three-volume series deploying MATLAB-based applications in almost every branch of science. This volume, presents interesting topics from different areas of engineering, signal and image processing based on the MATLAB environment. The book consists of 20 excellent, insightful articles and the readers will find the results very useful to their work. This collection of high quality articles, refers to a large range of professional fields and may be used for scientific, engineering and educational purposes.

### Smart Technologies for Energy, Environment and Sustainable Development CRC Press

This book includes selected peer-reviewed papers presented at the International Conference on Modeling, Simulation and Optimization, organized by National Institute of Technology, Silchar, Assam, India, during 3-5 August 2020. The book covers topics of modeling, simulation and optimization, including computational modeling and simulation, system modeling and simulation, device/VLSI modeling and simulation, control theory and applications, modeling and simulation of energy system and optimization. The book disseminates various models of diverse systems and includes solutions of emerging challenges of diverse scientific fields.

### Fuel Cells Springer Nature

This book compiles the best selected research papers presented during the 2nd International Conference on Intelligent Computing Techniques for Smart Energy Systems (ICTSES 2021), held at Manipal University, Jaipur, Rajasthan, India. It presents the diligent work of the research community where intelligent computing techniques are applied in allied fields of engineering ranging from engineering materials to electrical engineering to electronics and communication engineering- to computer-related fields. The theoretical research concepts are supported with extensive reviews highlighting the trends in the possible and real-life applications of computational intelligence. The high-quality content with broad range of the topics is thoroughly peer-reviewed and published on suitable recommendations.

### Smart and Intelligent Systems CRC Press

This book features selected high-quality papers presented at International Conference on Electrical and Electronics Engineering (ICEEE 2022), jointly organized by University of Malaya and Bharath Institute of Higher Education and Research India during January 8-9, 2022, at NCR New Delhi, India. The book focuses on current development in the fields of electrical and electronics engineering. The book one covers electrical engineering topics-power and energy including renewable energy, power electronics and applications, control, and automation and instrumentation and book two covers the areas of robotics, artificial intelligence and IoT, electronics devices, circuits and systems, wireless and optical communication, RF and microwaves, VLSI, and signal processing. The book is beneficial for readers from both academia and industry.

### Renewable Energy Systems Springer Nature

Explore the latest power electronics principles, practices, and applications This electrical engineering guide offers comprehensive coverage of design, modeling, simulation, and control for power electronics. The book describes real-world applications for the technology and features case studies worked out in both MATLAB and Simulink. Presented in an accessible style, Power Electronics Step-by-Step: Design, Modeling, Simulation, and Control focuses on the latest technologies, such as DC-based systems, and emphasizes the averaging technique for both simulation and modeling. You will get photos, diagrams, flowcharts, graphs, equations, and tables that illustrate each topic. Circuit components Non-isolated DC/DC conversion Power analysis DC to single-phase AC conversion Single-phase AC to DC conversion Galvanic isolated DC/DC conversion Power conversion for three-phase AC Bidirectional power conversion Averaging model for simulation Dynamic modeling of DC/DC converters Regulation of voltage and current

### Advanced Control of Power Converters CRC Press

This book presents select peer-reviewed proceedings of the International Conference on Advances in Renewable Energy and Electric Vehicles (AREEV 2022). The topics covered include renewable energy sources, electric vehicles, energy storage systems, power system protection & security, smart grid, and wide bandgap semiconductor technologies. The book also discusses applications of signal processing, artificial neural networks, optimal and robust control systems, and modeling and simulation of power electronic converters. The book is a valuable reference for academics and professionals interested in power systems, renewable energy, and electric vehicles.

### Grid-Connected Renewable Energy Sources Springer Nature

This book aims to provide practical aspects of, and an introduction to, the applications of various technological advancement tools, such as AI, machine learning to design, big data, cloud computing, and IoT, to model, characterize, optimize, forecast, and do performance prediction of renewable energy exploitation. It further discusses new avenues for energy sources such as hydrogen energy generation and energy storage technologies including existing policies and case studies for a better understanding of renewable energy generation. Features: Covers technologies considered to explore, predict, and perform operation and maintenance of renewable energy sources. Aids in the design and use of renewable energy sources, including the application of artificial intelligence in a real-time environment. Includes IoT, cloud computing, big data, smart grid, and different optimization techniques for resource forecasting, installation, operation, and optimization of energy. Discusses the principle of integration/hybridization of renewable energy sources along with their optimization based on energy requirements. Reviews the concepts and challenges involved in the implementation of smart grids. This book is aimed at researchers and graduate students in renewable energy engineering, computer and mechanical engineering, novel technologies, and intelligent systems.

### Recent Advances in Mechanical Engineering Springer Nature

Explore the prospective developments in energy systems and transportation through an in-depth examination of Distributed Energy Resources and Electric Vehicle: Analysis and Optimisation of Network Operations . This innovative publication explores the realm of renewable energy, electric vehicles, and their in uence on network operations, offering valuable perspectives for readers from diverse disciplines. This extensive publication delves into the complex interplay between distributed energy resources (DERs) and electric vehicles (EVs), as well as their incorporation into established power grids. The subject matter encompasses a diverse array of topics, encompassing the attributes and advantages of distributed energy resources (DERs) and electric vehicles (EVs), obstacles related

to grid integration, efficient allocation of resources, and strategies pertaining to demand response.

The book offers a comprehensive exploration of system analysis and optimisation techniques, emphasising the effective utilisation of distributed energy resources (DERs) and electric vehicles (EVs) in energy networks. It aims to equip readers with a robust comprehension of strategies to optimise the performance and potential of DERs and EVs in this context. The book focuses on pioneering research and innovative solutions that are at the forefront of enhancing network operations. The authors demonstrate the novelty and applicability of their findings through the examination of real-world case studies and the utilisation of sophisticated mathematical models. This book serves as a highly valuable resource for individuals engaged in research, engineering, policy-making, and industry-related activities who are interested in effectively navigating the dynamic realm of energy systems and transportation. It equips them with the necessary knowledge and insights to make well-informed decisions that contribute to the attainment of a sustainable future.

### Recent Advances in Engineering – Proceedings of ICRAE 2022 John Wiley & Sons

SMART GRIDS AND MICROGRIDS Written and edited by a team of experts in the field, this is the most comprehensive and up-to-date study of smart grids and microgrids for engineers, scientists, students, and other professionals. The power supply is one of the most important issues of our time. In every country, all over the world, from refrigerators to coffee makers to heating and cooling, almost everyone in the world needs to have access to power. As the global demand rises, new methods of delivering power, such as smart grids and microgrids, have, out of necessity or choice, been developed and researched. In this book, modern and advanced concepts of both microgrid and smart grid technology are introduced. Beginning from the brief fundamental concepts of microgrids and its various constituents this team of experts discusses different architectures, control issues, communication challenges, measurement, stability, power quality and mitigation, protection, and power electronic aspects of the microgrid system. Through this book, tools and techniques needed to design both microgrids and smart grids are discussed. Recent and developing topics like smart meter impact, remote data monitoring, communication protocols, cybersecurity, artificial intelligence, big data, IoT, and many others are covered. Furthermore, this new volume also covers simulation and stability analysis tools pertaining to microgrids and smart grids. Throughout the book, detailed examples of microgrid and smart grid design and development strategies are provided, based on different constraints and requirements. Case studies, numerical models, and design examples are also included. Whether for the veteran engineer or student, this is a must-have volume for any library. Audience: Engineers, scientists, industry professionals, students, and other lay people involved in the business of smart grids and microgrids

### Proceedings of 3rd International Conference on Machine Learning, Advances in Computing, Renewable Energy and Communication Springer Nature

This book describes advanced research results on Modeling and Control designs for Fuel Cells and their hybrid energy systems. Filled with simulation examples and test results, it provides detailed discussions on Fuel Cell Modeling, Analysis, and Nonlinear control. Beginning with an introduction to Fuel Cells and Fuel Cell Power Systems, as well as the fundamentals of Fuel Cell Systems and their components, it then presents the Linear and Nonlinear modeling of Fuel Cell Dynamics. Typical approaches of Linear and Nonlinear Modeling and Control Design methods for Fuel Cells are also discussed. The authors explore the Simulink implementation of Fuel Cells, including the modeling of PEM Fuel Cells and Control Designs. They cover the applications of Fuel cells in vehicles, utility power systems, and stand-alone systems, which integrate Fuel Cells, Wind Power, and Solar Power. Mathematical preliminaries on Linear and Nonlinear Control are provided in an appendix.

### Innovations in Electrical and Electronic Engineering CRC Press

The book covers different aspects of real-world applications of optimization algorithms. It provides insights from the Fourth International Conference on Harmony Search, Soft Computing and Applications held at BML Munjal University, Gurgaon, India on February 7-9, 2018. It consists of research articles on novel and newly proposed optimization algorithms; the theoretical study of nature-inspired optimization algorithms; numerically established results of nature-inspired optimization algorithms; and real-world applications of optimization algorithms and synthetic benchmarking of optimization algorithms.

### MATLAB Springer Science & Business Media

Modeling is the process of formulating a mathematical description of the system. A model, no matter how detailed, is never a completely accurate representation of a real physical system. A mathematical model is always just an approximation of the true, physical reality of the system dynamics. Uncertainty refers to the differences or errors between model and real systems and whatever methodology is used to present these errors will be called an uncertainty model. Successful robust control-system design would depend on, to a certain extent, an appropriate description of the perturbation considered. Modeling the uncertainties in the switch mode DC-DC converters is an important step in designing robust controllers. This book studies different techniques which can be used to extract the uncertain model of DC-DC converters. Once the uncertain model is extracted, robust control techniques such as  $\infty$  and  $\mu$  synthesis can be used to design the robust controller. The book composed of two case studies. The first one is a buck converter and the second one is a Zeta converter. MATLAB® programming is used extensively throughout the book. Some sections use PLECS® as well. This book is intended to be guide for both academicians and practicing engineers.

### Advances in Control Systems and its Infrastructure Springer Nature

This book is a collection of high-quality research papers presented at the International Conference on Smart and Intelligent Systems (SIS 2021), which will be held in Velagapudi Ramakrishna Siddhartha Engineering College (VRSEC), Andhra Pradesh, India, during February 25-26, 2021, in virtual mode. It highlights how recent informatics intelligent systems have successfully been used to develop innovative smart techniques and infrastructure in the field of modern engineering and technology. The book will also be of interest to those working in the field of computational intelligence, smart computer network and security analysis, control and automation system, cloud computing, fog computing and IoT, smart grid communication, smart cities, solar cell synthesis and their performance, green technology, and many more. The contents of this book prove useful to researchers and professionals.

### Enabling Methodologies for Renewable and Sustainable Energy CRC Press

The book presents the analysis and control of numerous DC-DC converters widely used in several applications such as standalone, grid integration, and motor drives-based renewable energy

systems. The book provides extensive simulation and practical analysis of recent and advanced DC-DC power converter topologies. This self-contained book contributes to DC-DC converters design, control techniques, and industrial as well as domestic applications of renewable energy systems. This volume will be useful for undergraduate/postgraduate students, energy planners, designers, system analysis, and system governors.

*Wave and Tidal Energy* CRC Press

The book provides easy interpretable explanations for the key technologies involved in Electric Vehicles and Hybrid Electric Vehicles. The authors discuss the various electrical machines, drives, and controls used in EV and HEV. The book provides a detailed coverage of Regenerative Braking Systems used in EV and HEV. The book also illustrates the battery technology and battery management systems in EV and HEV. This book is intended for academicians, researchers and industrialists. In addition, this book has the following features Discusses the various Economic and Environmental Impact of Electric and Hybrid Electric Vehicles Discusses the role of Artificial Intelligence in Electric / Hybrid Electric Vehicles Illustrates the concept of Vehicle to Grid Technology and the smart charging station infrastructure and issues involved in the same Elucidates the concept of Internet of Vehicles Presents the latest research and applications in alternate energy vehicles *Power Electronics Step-by-Step: Design, Modeling, Simulation, and Control* Springer Nature The use of renewable energy sources (RESs) is a need of global society. This editorial, and its associated Special Issue "Grid-Connected Renewable Energy Sources", offers a compilation of some of the recent advances in the analysis of current power systems that are composed after the high penetration of distributed generation (DG) with different RESs. The focus is on both new control configurations and on novel methodologies for the optimal placement and sizing of DG. The eleven accepted papers certainly provide a good contribution to control deployments and methodologies for the allocation and sizing of DG.

*Advances in Smart Communication and Imaging Systems* Springer Nature

This book provides a thorough overview of cutting-edge research on electronics applications relevant to industry, the environment, and society at large. It covers a broad spectrum of application domains, from automotive to space and from health to security, while devoting special attention to the use of embedded devices and sensors for imaging, communication and control. The book is based on the 2019 ApplePies Conference, held in Pisa, Italy in September 2019, which brought together researchers and stakeholders to consider the most significant current trends in the field of applied electronics and to debate visions for the future. Areas addressed by the conference included information communication technology; biotechnology and biomedical imaging; space; secure, clean and efficient energy; the environment; and smart, green and integrated transport. As electronics technology continues to develop apace, constantly meeting previously unthinkable targets, further attention needs to be directed toward the electronics applications and the development of systems

that facilitate human activities. This book, written by industrial and academic professionals, represents a valuable contribution in this endeavor.

*Distributed Energy Resources and Electric Vehicle* CRC Press

The Proceedings of ICRAE deals with innovative ideas, different categories of green technologies and sustainable development including renewable energy sources, power systems, mathematical ecology, industrial technologies, and construction and material sciences. The chapters are written by eminent authors to propose improvement and expansion of processes and applications connected to sustainable development. Rapid urbanisation is proving to have direct consequences on the environment. Environmental awareness and protection is one of the challenging issues of new millennia. Industrialization and population explosion has opened new frontiers in the conservation of environmental protection. Any sustainable development has multifaceted approach, encompassing environmental, technological, social and economic developmental dimensions. The selected papers in this book have highlighted issues related to Green Technology and sustainable development and bridge the gap between technological advancement and its impact on the environment.

**Advances in Renewable Energy & Electric Vehicles** BoD – Books on Demand

This book presents select and peer-reviewed proceedings of the International Conference on Smart Communication and Imaging Systems (MedCom 2020). The contents explore the recent technological advances in the field of next generation communication systems and latest techniques for image processing, analysis and their related applications. The topics include design and development of smart, secure and reliable future communication networks; satellite, radar and microwave techniques for intelligent communication. The book also covers methods and applications of GIS and remote sensing; medical image analysis and its applications in smart health. This book can be useful for students, researchers and professionals working in the field of communication systems and image processing.

**Advanced Control of Power Converters** Springer Nature

This book reflects the latest research trends, methods and experimental results in the field of electrical and information technologies for rail transportation, which covers abundant state-of-the-art research theories and ideas. As a vital field of research that is highly relevant to current developments in a number of technological domains, the subjects it covered include intelligent computing, information processing, communication technology, automatic control, etc. The objective of the proceedings is to provide a major interdisciplinary forum for researchers, engineers, academicians and industrial professionals to present the most innovative research and development in the field of rail transportation electrical and information technologies. Engineers and researchers in academia, industry and government will also explore an insightful view of the solutions that combine ideas from multiple disciplines in this field. The volumes serve as an excellent reference work for researchers and graduate students working on rail transportation and electrical and information technologies.