

Wireless Power Transfer Using Resonant Inductive Coupling

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**2019 IEEE 19th
International Symposium on
Signal Processing and
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2019**

Wireless Information and

Power Transfer - Derrick
Wing Kwan Ng 2019-01-29
em style="mso-bidi-font-style:
normal;"Wireless Information
and Power Transfer offers an
authoritative and
comprehensive guide to the

theory, models, techniques, implementation and application of wireless information and power transfer (WIPT) in energy-constrained wireless communication networks. With contributions from an international panel of experts, this important resource covers the various aspects of WIPT systems such as, system modeling, physical layer techniques, resource allocation and performance analysis. The contributors also explore targeted research problems typically encountered when designing WIPT systems.

Wireless Power Transfer

Johnson I. Agbinya 2022-09-01
Nikola Tesla's dream in the early 20th century of a "World Wireless System" led him to build the Wardencllyffe Tower, a prototype base station serving as an emitter for his "World Wireless System". The base station was to supply wireless electrical energy to a distant receiver. This book builds upon that dream and is a result of intensive research interest in powerline, machine to machine communications

and wireless power transfer globally. Wireless energy transfer or Witricity (WIreless elecTRICITY) transfers electricity instead of data. The technology is useful in cases where instantaneous or continuous energy is needed but interconnecting wires are inconvenient, hazardous, or impossible. The transfer is made through inductive coupling and electromagnetic radiation. Inductive coupling provides optimum power delivery to a receiver load if both the emitter and the receiver achieve magnetic resonance concurrently. Energy transfer systems mostly use antennas operating in their near field regions. As fossil energy sources are being depleted rapidly worldwide and oil prices soar, solar energy enhanced with wireless power transfer (WPT) have become reasonable alternatives for renewable energy and power harvesting. They are finding use in transportation, electric and hybrid vehicles, very fast trains and the emerging field of Internet of Things. This book is

written by the leading experts on wireless energy transfer technology and its applications. It introduces and explains the technology in great details and provides the theory and practice of WPT through the two approaches of coupled mode theory and circuit theory. Both approaches are dependent on resonance techniques. The level of presentation is suitable for design and training. In depth coverage is provided on near field concepts; coupled-mode theory and models; circuit models of inductive antennas; radiative and inductive wireless power transfer, wireless power relay concepts, optimization techniques for wireless power transfer systems, control of wireless power transfer systems, wireless charging concepts; wireless energy transfer applications in electric vehicles, embedded medical systems and propagation in human tissues. Each chapter is written by experts on a selected aspect of wireless energy transfer. The authors

have gone to great lengths to provide worked examples to assist the reader in working through some of the difficult concepts and to allow more understanding. The book is an excellent foundation for applying wireless energy transfer technologies in most fields including transportation, communication, home automation, biomedical systems and home appliances. The book is recommended to practitioners and engineers in the power industry, students in universities and research institutes. Honours and post graduate students in Physics, electrical/electronic engineering and computer science will find the book easy to read and apply because of the mode of presentation.

Secrets of RF Circuit Design

- Joseph J. Carr 2001-01-01

BUILD THE CIRCUITS THAT MAKE WIRELESS WORK If you like hands-on electronics, you'll love Secrets of RF Circuit Design, Third Edition, by Popular Electronics writer Joe Carr. This update of the favorite RF circuit guide of

thousands of electronics enthusiasts takes you inside wireless technology with step-by-step, illustrated directions for dozens of usable projects. This super guide demonstrates RF theory as it shows you how to overcome the technical and materials challenges facing those who build real-world electronics. You learn how to design and build receiver circuits, RF bridges, amplifiers, receiver preselectors, simple spectrum analyzers, and time domain reflectometers. You get detailed insights into simple RF instruments, as well as UHF and microwave components...complete troubleshooting guidance...and handy parts lists and components sources. This new edition packs the latest information on directional and hybrid couplers, and seven new chapters on demodulators, circuit vectors, measuring L-C circuits, and filtering circuits against EMI. "...a great book on wireless technology for persons starting out in RF electronics, as well as for RF technicians and ham radio

operators." ---Cotter W. Sayre, author of *The Complete RF Technician's Handbook* (Amazon.com review)
Wireless Information and Power Transfer: A New Paradigm for Green Communications - Dushantha Nalin K. Jayakody 2017-07-20
This book presents breakthroughs in the design of Wireless Energy Harvesting (WEH) networks. It bridges the gap between WEH through radio waves communications and power transfer, which have largely been designed separately. The authors present an overview of the RF-EHNs including system architecture and RF energy harvesting techniques and existing applications. They also cover the idea of WEH in novel discoveries of information, the theoretical bounds in WEH, wireless sensor networks, usage of modern channel coding together with WEH, energy efficient resource allocation mechanisms, distributed self-organized energy efficient designs, delay-energy trade-off, specific

protocols for energy efficient communication designs, D2D communication and energy efficiency, cooperative wireless networks, and cognitive networks.

Trilogy of Wireless Power Transfer - Würth Elektronik
2019-03-15

Wireless Power Transfer via Radiowaves - Naoki Shinohara
2014-01-17

Recent advances in Wireless Power Transmission (WPT) technologies have enabled various engineering applications with potential product implementation. WPT can be utilized to charge batteries in various pieces of equipment without the need for a wired connection. Energy can be harvested from ambient RF and microwave radiation and 1 million kW microwaves can be transmitted from space to the ground. This book covers all the theory and technologies of WPT, such as microwave generators with semi-conductors and microwave tubes, antennas, phased arrays, beam efficiency, and rectifiers

(rectenna). The authors also discuss coupling WPT.

Applications, such as energy harvesting, sensor networks, point-to-point WPT, WPT to moving targets (airplane, vehicle, etc.) and Solar Power Satellite are also presented.

Wireless Power Transfer for Electric Vehicles and Mobile Devices - Chun T. Rim
2017-08-07

From mobile, cable-free re-charging of electric vehicles, smart phones and laptops to collecting solar electricity from orbiting solar farms, wireless power transfer (WPT) technologies offer consumers and society enormous benefits. Written by innovators in the field, this comprehensive resource explains the fundamental principles and latest advances in WPT and illustrates key applications of this emergent technology. Key features and coverage include: The fundamental principles of WPT to practical applications on dynamic charging and static charging of EVs and smartphones. Theories for inductive power transfer (IPT)

such as the coupled inductor model, gyrator circuit model, and magnetic mirror model. IPTs for road powered EVs, including controller, compensation circuit, electro-magnetic field cancel, large tolerance, power rail segmentation, and foreign object detection. IPTs for static charging for EVs and large tolerance and capacitive charging issues, as well as IPT mobile applications such as free space omnidirectional IPT by dipole coils and 2D IPT for robots. Principle and applications of capacitive power transfer. Synthesized magnetic field focusing, wireless nuclear instrumentation, and future WPT. A technical asset for engineers in the power electronics, internet of things and automotive sectors, *Wireless Power Transfer for Electric Vehicles and Mobile Devices* is an essential design and analysis guide and an important reference for graduate and higher undergraduate students preparing for careers in these

industries.

Wireless Power Transfer

Mohamed Zellagui 2021-08-18

Wireless power transfer (WPT) is a promising technology used to transfer electric energy from a transmitter to a receiver wirelessly without wires through various methods and technologies using time-varying electric, magnetic, or electromagnetic fields. It is an attractive solution for many industrial applications due to its many benefits over wired connections. This book discusses the theory and practical aspects of WPT technology.

Wireless-Powered Communication Networks -

Dusit Niyato 2016-11-17

A comprehensive introduction to architecture design, protocol optimization, and application development.

Technological Innovation for Cyber-Physical Systems Luis M. Camarinha-Matos

2016-03-24

This book constitutes the refereed proceedings of the 7th IFIP WG 5.5/SOCOLNET Advanced Doctoral Conference

on Computing, Electrical and Industrial Systems, DoCEIS 2016, held in Costa de Caparica, Portugal, in April 2016. The 53 revised full papers were carefully reviewed and selected from 112 submissions. The papers present selected results produced in engineering doctoral programs and focus on research, development, and application of cyber-physical systems. Research results and ongoing work are presented, illustrated and discussed in the following areas: enterprise collaborative networks; ontologies; Petri nets; manufacturing systems; biomedical applications; intelligent environments; control and fault tolerance; optimization and decision support; wireless technologies; energy: smart grids, renewables, management, and optimization; bio-energy; and electronics.

Neural Computation, Neural Devices, and Neural Prosthesis - Zhi Yang
2014-04-15

In the past decades,

interdisciplinary investigations overlapping biology, medicine, information science, and engineering have formed a very exciting and active field that attracts scientists, medical doctors, and engineers with knowledge in different domains. A few examples of such investigations include neural prosthetic implants that aim to improve the quality of life for patients suffering from neurologic disease and injury; brain machine interfaces that sense, analyze, and translate electrical signals from the brain to build closed-loop, biofeedback systems; and fundamental studies of intelligence, cognitive functions, and psychological behaviors correlated to their neurological basis. Although this interdisciplinary area is still in its infancy, it can potentially create some of the most significant impact: treating diseases that are considered untreatable, interpretation and communication of neuron ensembles, or even a revolutionary perception and

understanding of life different from philosophical or immaterial approaches. Fortunately, several academic societies recognize the value and impact of this growing field, firmly supporting related research. Such support will drive a booming future in the next twenty or thirty years. Research in this area is frequently project-driven, and the generated knowledge has been scattered in different fields of neuroscience, computation, material and technology, circuits and system, clinical reports, and psychology—the scope considerably across the boundary of traditionally defined disciplines. Neural Computation, Neural Devices, and Neural Prosthesis is intended to assemble such knowledge, from there suggesting a systematic approach guiding future educational and research activities. The targeted audience includes both students and researchers.

Inductive Power Transfer Systems - Udaya K. Madawala

2017-05-15

One of the first books to describe and provide both theoretical and practical analyses on IPT technology Illustrated throughout with figures, circuit topologies, design examples, simulation/experimental results, and questions and answers Addresses a fast moving technology with applications in transport, telecommunications and industry Accompanying website includes MATLAB examples, exercises, problems and solutions

Wireless Power Transfer - Takehiro Imura 2020-06-16

This book describes systematically wireless power transfer technology using magnetic resonant coupling and electric resonant coupling and presents the latest theoretical and phenomenological approaches to its practical implementation, operation and its applications. It also discusses the difference between electromagnetic induction and magnetic resonant coupling, the

characteristics of various types of resonant circuit topologies and the unique features of magnetic resonant coupling methods. Designed to be self-contained, this richly illustrated book is a valuable resource for a broad readership, from researchers to engineers and anyone interested in cutting-edge technologies in wireless power transfer.

Emerging Capabilities and Applications of Wireless

Power Transfer - Triviño-Cabrera, Alicia 2018-09-21

Technologies that enable powering a device without the need for being connected with a cable to the grid are gaining attention in recent years due to the advantages that they provide. They are a commodity to users and provide additional functionalities that promote autonomy among the devices. Emerging Capabilities and Applications of Wireless Power Transfer is an essential reference source that analyzes the different applications of wireless power transfer technologies and how the

technologies are adapted to fulfill the electrical, magnetic, and design-based requirements of different applications.

Featuring research on topics such as transfer technologies, circuit analysis, and inductive power transfer, this book is a vital resource for academicians, electrical engineers, scientists, researchers, and industry professionals seeking coverage on device power and creating autonomy through alternative power options for devices.

[Energy Harvesting for Wireless Sensor Networks](#) - Olfa Kanoun 2018-11-19

Wireless sensors and sensor networks (WSNs) are nowadays becoming increasingly important due to their decisive advantages. Different trends towards the Internet of Things (IoT), Industry 4.0 and 5G Networks address massive sensing and admit to have wireless sensors delivering measurement data directly to the Web in a reliable and easy manner. These sensors can only be supported, if sufficient energy efficiency

and flexible solutions are developed for energy-aware wireless sensor nodes. In the last years, different possibilities for energy harvesting have been investigated showing a high level of maturity. This book gives therefore an overview on fundamentals and techniques for energy harvesting and energy transfer from different points of view. Different techniques and methods for energy transfer, management and energy saving on network level are reported together with selected interesting applications. The book is interesting for researchers, developers and students in the field of sensors, wireless sensors, WSNs, IoT and manifold application fields using related technologies. The book is organized in four major parts. The first part of the book introduces essential fundamentals and methods, while the second part focusses on vibration converters and hybridization. The third part is dedicated to wireless energy transfer, including both RF and

inductive energy transfer. Finally, the fourth part of the book treats energy saving and management strategies. The main contents are: Essential fundamentals and methods of wireless sensors Energy harvesting from vibration Hybrid vibration energy converters Electromagnetic transducers Piezoelectric transducers Magneto-electric transducers Non-linear broadband converters Energy transfer via magnetic fields RF energy transfer Energy saving techniques Energy management strategies Energy management on network level Applications in agriculture Applications in structural health monitoring Application in power grids Prof. Dr. Olfa Kanoun is professor for measurement and sensor technology at Chemnitz university of technology. She is specialist in the field of sensors and sensor systems design. *Wireless Power Transfer* Eugen Coca 2016-06-29 Wireless power transfer techniques have been gaining researchers' and industry

attention due to the increasing number of battery-powered devices, such as mobile computers, mobile phones, smart devices, intelligent sensors, mainly as a way to replace the standard cable charging, but also for powering battery-less equipment. The storage capacity of batteries is an extremely important element of how a device can be used. If we talk about battery-powered electronic equipment, the autonomy is one factor that may be essential in choosing a device or another, making the solution of remote powering very attractive. A distinction has to be made between the two forms of wireless power transmission, as seen in terms of how the transmitted energy is used at the receiving point: - Transmission of information or data, when it is essential for an amount of energy to reach the receiver to restore the transmitted information; - Transmission of electric energy in the form of electromagnetic field, when the energy transfer efficiency is essential, the power being used to energize

the receiving equipment. The second form of energy transfer is the subject of this book.

Compact Size Wireless Power Transfer Using Defected Ground Structures

- Sherif Hekal 2019-05-29

This book addresses the design challenges in near-field wireless power transfer (WPT) systems, such as high efficiency, compact size, and long transmission range. It presents new low-profile designs for the TX/RX structures using different shapes of defected ground structures (DGS) like (H, semi-H, and spiral-strips DGS). Most near-field WPT systems depend on magnetic resonant coupling (MRC) using 3-D wire loops or helical antennas, which are often bulky. This, in turn, poses technical difficulties in their application in small electronic devices and biomedical implants. To obtain compact structures, printed spiral coils (PSCs) have recently emerged as a candidate for low-profile WPT systems. However, most of the MRC WPT systems that use PSCs have limitations in

the maximum achievable efficiency due to the feeding method. Inductive feeding constrains the geometric dimensions of the main transmitting (TX)/receiving (RX) resonators, which do not achieve the maximum achievable unloaded quality factor. This book will be of interest to researchers and professionals working on WPT-related problems.

Frontiers of Engineering -

National Academy of

Engineering 2018-01-22

This volume presents papers on the topics covered at the National Academy of Engineering's 2017 US Frontiers of Engineering Symposium. Every year the symposium brings together 100 outstanding young leaders in engineering to share their cutting-edge research and innovations in selected areas.

The 2017 symposium was held September 25-27 at the United Technologies Research Center in East Hartford, Connecticut.

The intent of this book is to convey the excitement of this unique meeting and to

highlight innovative developments in engineering research and technical work.

Inductive Powering Koenraad van Schuylenbergh 2009-05-31

Inductive powering has been a reliable and simple method for many years to wirelessly power devices over relatively short distances, from a few centimetres to a few feet.

Examples are found in biomedical applications, such as cochlear implants; in RFID, such as smart cards for building access control; and in consumer devices, such as electrical toothbrushes. Device sizes shrunk considerably the past decades, demanding accurate design tools to obtain reliable link operation in demanding environments. With smaller coil sizes, the link efficiency drops dramatically to a point where the commonly used calculation methods become invalid. *Inductive Powering: Basic Theory and Application to Biomedical Systems* lists all design equations and topology alternatives to successfully build an inductive power and

data link for your specific application. It also contains practical guidelines to expand the external driver with a servomechanism that automatically tunes itself to varying coupling and load conditions.

Wireless Power Transfer -

Johnson I. Agbinya 2022-09-01
Wireless Power Transfer is the second edition of a well received first book, which published in 2012. It represents the state-of-the-art at the time of writing, and addresses a unique subject of great international interest in terms of research. Most of the chapters are contributed by the main author, though as in the first edition several chapters are contributed by other authors. The authors of the various chapters are experts in their own right on the specific topics within wireless energy transfer. Compared to the first edition, this new edition is more comprehensive in terms of the concepts discussed, and the range of current industrial applications which are presented, such as those of

magnetic induction. From the eleven chapters of the first edition, this second edition has expanded to twenty chapters. More chapters on the theoretical foundations and applications have been included. This new edition also contains chapters which deal with techniques for reducing power losses in wireless power transfer systems. In this regard, specific chapters discuss impedance matching methods, frequency splitting and how to deploy systems based on frequency splitting. A new chapter on multi-dimensional wireless power transfer has also been added. The design of wireless power transfer systems based on bandpass filtering approach has been included, in addition to the two techniques using couple mode theory and electronic circuits. The book has retained chapters on how to increase efficiency of power conversion and induction, and also how to control the power systems. Furthermore, detailed techniques for power relay, including applications, which

were also discussed in the first edition, have been updated and kept. The book is written in a progressive manner, with a knowledge of the first chapters making it easier to understand the later chapters. Most of the underlying theories covered in the book are clearly relevant to inductive near field communications, robotic control, robotic propulsion techniques, induction heating and cooking and a range of mechatronic systems.

Basic Electromagnetism and Materials - André Moliton
2008-11-01

This textbook can be used to teach electromagnetism to a wide range of undergraduate science majors in physics, electrical engineering or materials science. By making lesser demands on mathematical knowledge than typical texts, and by emphasizing electromagnetic properties of materials and their applications, this text is particularly appropriate for students of materials science. Many competing books focus on the study of propagation

waves either in the microwave or optical domain, whereas Basic Electromagnetism and Materials covers the entire electromagnetic domain and the physical response of materials to these waves.

Switchmode RF Power Amplifiers - Andrei Grebennikov
2011-04-01

A majority of people now have a digital mobile device whether it be a cell phone, laptop, or blackberry. Now that we have the mobility we want it to be more versatile and dependable; RF power amplifiers accomplish just that. These amplifiers take a small input and make it stronger and larger creating a wider area of use with a more robust signal. Switching mode RF amplifiers have been theoretically possible for decades, but were largely impractical because they distort analog signals until they are unrecognizable. However, distortion is not an issue with digital signals—like those used by WLANs and digital cell phones—and switching mode RF amplifiers have become a hot area of

RF/wireless design. This book explores both the theory behind switching mode RF amplifiers and design techniques for them. *Provides essential design and implementation techniques for use in cma2000, WiMAX, and other digital mobile standards *Both authors have written several articles on the topic and are well known in the industry *Includes specific design equations to greatly simplify the design of switchmode amplifiers

Tesla's Experiments with Alternating Currents - Nikola Tesla 2020-10-27

Nikola Tesla is best known for his contributions to the design of the modern alternating current (AC) electricity supply system. His alternating current (AC) induction motor and related polyphase AC patents became the cornerstone of the polyphase system. This collection provides a remarkable insight into the very beginning of electric engineering. _x000D_ Table of Contents: _x000D_ Experiments with Alternate Currents of

High Potential and High Frequency_x000D_ Experiments with Alternate Currents of Very High Frequency and Their Application to Methods of Artificial Illumination (Lecture)_x000D_ Experiments with Alternate Currents of Very High Frequency and Their Application to Methods of Artificial Illumination (Article)_x000D_ My Inventions - Autobiography of Nikola Tesla_x000D_x000D_x000D_ **Wireless Power Transfer** - Fouad Sabry 2022-10-15 What Is Wireless Power Transfer The transmission of electrical energy in the absence of cables as a physical connection is referred to variously as wireless power transfer (WPT), wireless power transmission (WPT), wireless energy transmission (WET), or electromagnetic power transfer (EPT). In a system for wirelessly transmitting power, a transmitter device is propelled by electric power derived from a power source. This drives the device to generate a time-varying

electromagnetic field, which in turn transmits power across space to a receiver device. The receiver device then extracts power from the field and supplies it to an electrical load. By removing the need for cables and batteries, the technology of wireless power transfer may increase the portability, convenience, and safety of an electronic gadget for all of its users. It is helpful to employ wireless power transmission in order to power electrical equipment in situations where physically connecting cables would be difficult, harmful, or otherwise impossible. How You Will Benefit (I) Insights, and validations about the following topics: Chapter 1: Wireless power transfer Chapter 2: Microwave Chapter 3: Electromagnetic compatibility Chapter 4: Antenna (radio) Chapter 5: Klystron Chapter 6: Near and far field Chapter 7: Index of electronics articles Chapter 8: Resonator Chapter 9: Spark-gap transmitter Chapter 10: Loop antenna Chapter 11: Index of electrical

engineering articles Chapter 12: Grid dip oscillator Chapter 13: Coupling (electronics) Chapter 14: Inductive charging Chapter 15: Dielectric resonator antenna Chapter 16: WREL (technology) Chapter 17: Resonant inductive coupling Chapter 18: Qi (standard) Chapter 19: Magnetoquasistatic field Chapter 20: Glossary of electrical and electronics engineering Chapter 21: History of the Tesla coil (II) Answering the public top questions about wireless power transfer. (III) Real world examples for the usage of wireless power transfer in many fields. (IV) 17 appendices to explain, briefly, 266 emerging technologies in each industry to have 360-degree full understanding of wireless power transfer' technologies. Who This Book Is For Professionals, undergraduate and graduate students, enthusiasts, hobbyists, and those who want to go beyond basic knowledge or information for any kind of wireless power transfer.

Wireless Power Transfer -

Johnson I. Agbinya 2015-12-01

Wireless Power Transfer is the second edition of a well received first book, which published in 2012. It represents the state-of-the-art at the time of writing, and addresses a unique subject of great international interest in terms of research. Most of the chapters are contributed by the main author, though as in the first edition several chapters are contributed by other authors. The authors of the various chapters are experts in their own right on the specific topics within wireless energy transfer. Compared to the first edition, this new edition is more comprehensive in terms of the concepts discussed, and the range of current industrial applications which are presented, such as those of magnetic induction. From the eleven chapters of the first edition, this second edition has expanded to twenty chapters. More chapters on the theoretical foundations and applications have been included. This new edition also

contains chapters which deal with techniques for reducing power losses in wireless power transfer systems. In this regard, specific chapters discuss impedance matching methods, frequency splitting and how to deploy systems based on frequency splitting. A new chapter on multi-dimensional wireless power transfer has also been added. The design of wireless power transfer systems based on bandpass filtering approach has been included, in addition to the two techniques using couple mode theory and electronic circuits. The book has retained chapters on how to increase efficiency of power conversion and induction, and also how to control the power systems. Furthermore, detailed techniques for power relay, including applications, which were also discussed in the first edition, have been updated and kept. The book is written in a progressive manner, with a knowledge of the first chapters making it easier to understand the later chapters. Most of the underlying theories covered in

the book are clearly relevant to inductive near field communications, robotic control, robotic propulsion techniques, induction heating and cooking and a range of mechatronic systems.

Inductive Links for Wireless Power Transfer - Pablo Pérez-Nicoli 2021-07-10

This book presents a system-level analysis of inductive wireless power transfer (WPT) links. The basic requirements, design parameters, and utility of key building blocks used in inductive WPT links are presented, followed by detailed theoretical analysis, design, and optimization procedure, while considering practical aspects for various application domains. Readers are provided with fundamental, yet easy to follow guidelines to help them design high-efficiency inductive links, based on a set of application-specific target specifications. The authors discuss a wide variety of recently proposed approaches to achieve the maximum efficiency point, such as the use of additional resonant coils,

matching networks, modulation of the load quality factor (Q-modulation), and adjustable DC-DC converters.

Additionally, the attainability of the maximum efficiency point together with output voltage regulation is addressed in a closed-loop power control mechanism. Numerous examples, including MATLAB/Octave calculation scripts and LTspice simulation files, are presented throughout the book. This enables readers to check their own results and test variations, facilitating a thorough understanding of the concepts discussed. The book concludes with real examples demonstrating the practical application of topics discussed. Covers both introductory and advanced levels of theory and practice, providing readers with required knowledge and tools to carry on from simple to advanced wireless power transfer concepts and system designs; Provides theoretical foundation throughout the book to address different design aspects; Presents numerous examples throughout

the book to complement the analysis and designs; Includes supplementary material (numerical and circuit simulation files) that provide a "hands-on" experience for the reader; Uses real examples to demonstrate the practical application of topics discussed.

Advanced Systems for Biomedical Applications -

Olfa Kanoun 2022-07-21

The book highlights recent developments in the field of biomedical systems covering a wide range of technological aspects, methods, systems and instrumentation techniques for diagnosis, monitoring, treatment, and assistance. Biomedical systems are becoming increasingly important in medicine and in special areas of application such as supporting people with disabilities and under pandemic conditions. They provide a solid basis for supporting people and improving their health care. As such, the book offers a key reference guide about novel medical systems for students, engineers, designers, and

technicians.

2018 International Power Electronics Conference

(IPEC Niigata 2018 ECCE Asia) - IEEE Staff 2018-05-20

1 Static Power Converters 2 Power Devices, Passive Components and System Integrations 3 Modeling, Simulation, EMI and Reliability 4 Electric Machines, Actuators and Sensors 5 Motor Control and Drives 6 Motion Control and Robotics 7 Conversion Technologies for Renewable Energy and Energy Saving 8 Power Electronics Applied to Transmission, Smart Grid, DC grid and Distribution Systems 9 Power Electronics and Drives Applied to Railway Systems 10 Power Electronics and Drives Applied to Electric and Hybrid Vehicles 11 Power Supply Technologies for Information and Communication Systems 12 Power Electronics and Drives Applied to Home Appliance 13 Power Electronics and Drives for Industrial Applications 14 Education in Power Electronics and Electrical Engineering 15 Other Related Topics

Magnetic Communications:
From Theory to Practice - Fei
Hu 2018-07-24

This book covers comprehensively the theories and practical design of magnetic communications. It emphasizes the differences between it and RF communications. It first provides the models and signal propagation principles of magnetic communication systems. Then it describes the hardware architecture of the system, including transmitter, MODEM, inductors, coils, etc. Then, it discusses the corresponding communication software design principles and cases. Finally, it presents several types of practical implementations and applications.

2019 IEEE Wireless Power Transfer Conference (WPTC)
IEEE Staff 2019-06-18

The WPTC2019 will report the state of the art advancement in wireless power theory, technologies and applications across the electromagnetic spectrum. It will celebrate technical excellences and

achievements of related materials, techniques, devices, circuits, antennas and systems in the field.

VLSI Design and Test -
Anirban Sengupta 2019-08-17

This book constitutes the refereed proceedings of the 23rd International Symposium on VLSI Design and Test, VDAT 2019, held in Indore, India, in July 2019. The 63 full papers were carefully reviewed and selected from 199 submissions. The papers are organized in topical sections named: analog and mixed signal design; computing architecture and security; hardware design and optimization; low power VLSI and memory design; device modelling; and hardware implementation.

On Light and Other High Frequency Phenomena - Nikola
Tesla 2020-12-08

On Light and Other High Frequency Phenomena is a lecture by Nikola Tesla. He presents his attempts to develop a wireless lighting system based on near-field inductive and capacitive coupling.

Wireless Power Transfer -

Naoki Shinohara 2018-06

This book covers the very latest in theory and technology for Wireless Power Transfer (WPT), for both coupling as well as radiative WPT. It describes the theory as well as the technology and applications.

Advances in Energy Systems -

Peter D. Lund 2019-02-06

A guide to a multi-disciplinary approach that includes perspectives from noted experts in the energy and utilities fields. *Advances in Energy Systems* offers a stellar collection of articles selected from the acclaimed journal *Wiley Interdisciplinary Review: Energy and Environment*. The journal covers all aspects of energy policy, science and technology, environmental and climate change. The book covers a wide range of relevant issues related to the systemic changes for large-scale integration of renewable energy as part of the on-going energy transition. The book addresses smart energy systems technologies, flexibility

measures, recent changes in the marketplace and current policies. With contributions from a list of internationally renowned experts, the book deals with the hot topic of systems integration for future energy systems and energy transition. This important resource: Contains

contributions from noted experts in the field. Covers a broad range of topics on the topic of renewable energy. Explores the technical impacts of high shares of wind and solar power. Offers a review of international smart-grid policies. Includes information on wireless power transmission. Presents an authoritative view of micro-grids. Contains a wealth of other relevant topics. Written for energy planners, energy market professionals and technology developers. *Advances in Energy Systems* is an essential guide with contributions from an international panel of experts that addresses the most recent smart energy technologies.

*Key Technologies of
Magnetic Inductive Coupled Resonant*

Wireless Power Transfer

Yiming Zhang 2017-12-21

This thesis focuses on the key technologies involved in magnetically coupled Wireless Power Transfer (WPT). Starting from the basic structures and theories of WPT, it addresses four fundamental aspects of these systems. Firstly, it analyzes the factors affecting transfer efficiency and compares various methods for reducing the working frequency. Secondly, it discusses frequency splitting and offers a physical explanation. Thirdly, it proposes and assesses three multiple-load transfer structures. Lastly, it investigates WPT systems with active voltage-source and current-source load. As such, the thesis offers readers a deeper understanding of WPT technology, while also proposing insightful new advances.

Green Technology for Smart City and Society - Renu Sharma
2020-11-30

This book includes selected papers from the International

Conference on Green Technology for Smart City and Society (GTSCS 2020), organized by the Institute of Technical Education and Research, Siksha 'O' Anusandhan University, Bhubaneswar, India, during 13-14 August 2020. The book covers topics such as machine learning, artificial intelligence, deep learning, optimization algorithm, IoT, signal processing, etc. The book is helpful for researchers working in the discipline of Electrical, Electronics and Computer Science. The researchers working in the allied domain of communication and control will also find the book useful as it deals with the latest methodologies and applications.

Modelling of Wireless Power Transfer - Ben Minnaert
2021-03-05

Wireless power transfer allows the transfer of energy from a transmitter to a receiver across an air gap, without any electrical connections. Technically, any device that needs power can become an

application for wireless power transmission. The current list of applications is therefore very diverse, from low-power portable electronics and household devices to high-power industrial automation and electric vehicles. With the rise of IoT sensor networks and Industry 4.0, the presence of wireless energy transfer will only increase. In order to improve the current state of the art, models are being developed and tested experimentally. Such models allow simulating, quantifying, predicting, or visualizing certain aspects of the power transfer from transmitter(s) to receiver(s). Moreover, they often result in a better understanding of the fundamentals of the wireless link. This book presents a wonderful collection of peer-reviewed papers that focus on the modelling of wireless power transmission. It covers both inductive and capacitive wireless coupling and includes work on multiple transmitters and/or receivers.

Wireless Power Transfer for

Electric Vehicles: Foundations and Design

Approach - Alicia Triviño-Cabrera 2019-09-19

This book describes the fundamentals and applications of wireless power transfer (WPT) in electric vehicles (EVs). Wireless power transfer (WPT) is a technology that allows devices to be powered without having to be connected to the electrical grid by a cable. Electric vehicles can greatly benefit from WPT, as it does away with the need for users to manually recharge the vehicles' batteries, leading to safer charging operations. Some wireless chargers are available already, and research is underway to develop even more efficient and practical chargers for EVs. This book brings readers up to date on the state-of-the-art worldwide. In particular, it provides:

- The fundamental principles of WPT for the wireless charging of electric vehicles (car, bicycles and drones), including compensation topologies, bi-directionality and coil topologies.
- Information on

international standards for EV wireless charging. • Design procedures for EV wireless chargers, including software files to help readers test their own designs. • Guidelines on the components and materials for EV wireless chargers. • Review and analysis of the main control algorithms applied to EV wireless chargers. • Review and analysis of commercial EV wireless charger products coming to the market and the main research projects on this topic being carried out worldwide. The book provides essential practical guidance on how to design wireless chargers for electric vehicles, and supplies MATLAB files that demonstrate the complexities of WPT technology, and which can help readers design their own chargers.

Wireless Power Transfer Algorithms, Technologies and Applications in Ad Hoc Communication Networks -

Sotiris Nikolettseas 2016-11-28
This book is the first systematic exposition on the emerging domain of wireless power

transfer in ad hoc communication networks. It selectively spans a coherent, large spectrum of fundamental aspects of wireless power transfer, such as mobility management in the network, combined wireless power and information transfer, energy flow among network devices, joint activities with wireless power transfer (routing, data gathering and solar energy harvesting), and safety provisioning through electromagnetic radiation control, as well as fundamental and novel circuits and technologies enabling the wide application of wireless powering. Comprising a total of 27 chapters, contributed by leading experts, the content is organized into six thematic sections: technologies, communication, mobility, energy flow, joint operations, and electromagnetic radiation awareness. It will be valuable for researchers, engineers, educators, and students, and it may also be used as a supplement to academic courses on algorithmic

applications, wireless

protocols, distributed
computing, and networking.