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Microwave systems are key components of every modern wireless communication system. The main objective of this book was to collect as many different state-of-the-art studies as possible in order to cover in a single volume the main aspects of microwave systems and applications. This book contains 17 chapters written by acknowledged experts, researchers, academics, and microwave engineers, providing comprehensive information and covering a wide range of topics on all aspects of microwave systems and applications. This book is divided into four parts. The first part is devoted to microwave components. The second part deals with microwave ICs and innovative techniques for on-chip antenna design. The third part presents antenna design cases for microwave systems. Finally, the last part covers different applications of microwave systems.

This book constitutes the thoroughly refereed proceedings of the 7th International Congress on Telematics and Computing, WITCOM 2018, held in Mazatlán, Mexico in November 2018. The 23 full papers presented in this volume were carefully reviewed and selected from 57 submissions. They present and organize the knowledge from within the field of telematics and security, data analytics and Machine Learning, IoT and mobile computing.

Wearable electronics, wireless devices, and other mobile technologies have revealed a deficit and a necessity for innovative methods of gathering and utilizing power. Drawing on otherwise wasted sources of energy, such as solar, thermal, and biological, is an important part of discovering future energy solutions. Innovative Materials and Systems for Energy Harvesting Applications reports on some of the best

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tools and technologies available for powering humanity's growing thirst for electronic devices, including piezoelectric, solar, thermoelectric, and electromagnetic energies. This book is a crucial reference source for academics, industry professionals, and scientists working toward the future of energy.

This volume comprises select proceedings of ETAEERE-2016. The volume offers state-of-the-art chapters on energy management systems (EMS), renewable energy resources, micro-generation, green communications architectures and frameworks, green computing and education as well as energy-aware process optimization. The contents covers a wide variety of topics and aspects including management of renewable energy systems and environmental challenges. The contents of this volume will be useful to researchers and practicing engineers working in the areas of smart grids and renewable energy generation, distribution, and management.

Rectenna Solar Cells discusses antenna-coupled diode solar cells, an emerging technology that has the potential to provide ultra-high efficiency, low-cost solar energy conversion. This book will provide an overview of solar rectennas, and provide thorough descriptions of the two main components: the diode, and the optical antenna. The editors discuss the science, design, modeling, and manufacturing of the antennas coupled with the diodes. The book will provide concepts to understanding the challenges, fabrication technologies, and materials required to develop rectenna structures. Written by experts in their specialized fields.

Today, computer science engineering and telecommunications are two important areas linked and even inseparable. This is obvious for the user who connects the modem of his computer on his mobile phone or telephone line to access, via the global data network, the information

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available on the servers. The both domains are evolving rapidly and the development of new architectures of systems dedicated to telecommunications and computing becomes essential. Especially, wireless transmission systems with high data rate. Two parts of these systems should be developed software and hardware. Another area that is renewable energies becomes more attractive for researchers in order to develop new conversion systems with good performances, and a good optimization of energy. For example, in wireless sensor systems, we try to develop new protocols permitting to have a good autonomy in terms of energy.

Emerging Capabilities and Applications of Wireless Power Transfer IGI Global

The communication field is evolving rapidly in order to keep up with society's demands. As such, it becomes imperative to research and report recent advancements in computational intelligence as it applies to communication networks. The Handbook of Research on Recent Developments in Intelligent Communication Application is a pivotal reference source for the latest developments on emerging data communication applications. Featuring extensive coverage across a range of relevant perspectives and topics, such as satellite communication, cognitive radio networks, and wireless sensor networks, this book is ideally designed for engineers, professionals, practitioners, upper-level students, and academics seeking current information on emerging communication networking trends.

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

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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. The Wireless Power Transfer concept is continuously and rapidly evolving and new challenges arise every day. As a result of these rapid changes, the need for up-to-date texts that address this growing field from an interdisciplinary perspective persists. This book, organized into ten chapters, presents interesting novel solutions in the exploitation of the near- and far-field techniques of wireless power transfer that will be used in the near future, as well as a bird's eye view of some aspects related to an emerging technological area that will change our lives and will change the paradigm of how we use electrical equipment. The book covers the theory and also the practical aspects of technology implementation in a way that is suitable for undergraduate and graduate-level students, as well as researchers and professional engineers.

Deforestation and forest degradation represent a significant fraction of the annual worldwide human-induced emission of greenhouse gases to the atmosphere, the main source of biodiversity losses and the destruction of millions of people's homes. Despite local/regional causes, its consequences are global. This book provides a general view about deforestation dynamics around the world, incorporating analyses of its causes, impacts and actions to prevent it. Its 17 Chapters, organized in three sections, refer to deforestation impacts on climate, soil, biodiversity and human population, but also describe several initiatives to prevent it. A special emphasis is

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given to different remote-sensing and mapping techniques that could be used as a source for decision-makers and society to promote forest conservation and control deforestation.

This book covers how Internet of Things (IoT) has a role in shaping the future of our communities. The author shows how the research and education ecosystem promoting impactful solutions-oriented science can help citizenry, government, industry, and other stakeholders to work collaboratively in order to make informed, socially-responsible, science-based decisions. Accordingly, he shows how communities can address complex, interconnected socio-environmental challenges. This book addresses the key inter-related challenges in areas such as the environment, climate change, mining, energy, agro-economic, water, and forestry that are limiting the development of a sustainable and resilient society -- each of these challenges are tied back to IoT based solutions. Presents research into sustainable IoT with respect to wireless communications, sensing, and systems Provides coverage of IoT technologies in sustainability, health, agriculture, climate change, mining, energy, water management, and forestry Relevant for academics, researchers, policy makers, city planners and managers, technicians, and industry professionals in IoT and sustainability

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

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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.

This text seeks to illuminate, mainly for the electrical power engineers of the future, the topic of large scale solar flux gathering schemes, which arguably represent the major source of renewable power available. The aim of the content is to impart, from an electromagnetic perspective, a deep and sound understanding of the topic of solar flux collection, ranging from the characteristics of light to the properties of antennas. To do this five chapters are employed to provide a thorough grounding in relevant aspects of electromagnetism and electromagnetic waves including optics, electromagnetic radiation and reception, aperture antennas and array antennas and the quantum electrodynamics aspects of optical absorption, as it relates to photovoltaic techniques. The principles developed in these chapters are then used to underpin and elucidate the main chapters on photovoltaic collectors, concentrated solar power collectors, satellite based collection systems and optical antennas. To establish the novel and transformative renewable technologies, which civilisation will soon require, in order to achieve sustainability quickly and effectively, the availability of professional engineers and scientists with a thorough and commanding grasp of the fundamental science is an absolutely essential prerequisite. This book provides this for solar power

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generating systems.

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

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communications, robotic control, robotic propulsion techniques, induction heating and cooking and a range of mechatronic systems.

The five volume set LNCS 10960 until 10964 constitutes the refereed proceedings of the 18th International Conference on Computational Science and Its Applications, ICCSA 2018, held in Melbourne, Australia, in July 2018. Apart from the general tracks, ICCSA 2018 also includes 34 international workshops in various areas of computational sciences, ranging from computational science technologies, to specific areas of computational sciences, such as computer graphics and virtual reality. The total of 265 full papers and 10 short papers presented in the 5-volume proceedings set of ICCSA 2018, were carefully reviewed and selected from 892 submissions.

This reference provides the reader with focused information about microstrip antenna design and applications. Readers are first introduced to the basic design of microstrip antennas. Subsequent chapters explain how microstrip antennas are suitable for practical applications. These chapters cover topics such as fractal and defected ground structure antennas, microstrip antenna evaluation, and the use of microstrip antennas in mobile communications and IoT applications. Scholars, researchers, and industrial professionals involved in the fields of electronics and electrical engineering as well as instrumentation will benefit from the information given in this book.

This book addresses the Internet of Things (IoT), an essential topic in the technology industry, policy, and engineering circles, and one that has become headline news in both the specialty press and the popular media. The book focuses on energy efficiency concerns in IoT and the requirements related to Industry 4.0. It is the first-ever “how-to” guide on frequently overlooked practical, methodological, and moral

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questions in any nations' journey to reducing energy consumption in IoT devices. The book discusses several examples of energy-efficient IoT, ranging from simple devices like indoor temperature sensors, to more complex sensors (e.g. electrical power measuring devices), actuators (e.g. HVAC room controllers, motors) and devices (e.g. industrial circuit-breakers, PLC for home, building or industrial automation). It provides a detailed approach to conserving energy in IoT devices, and comparative case studies on performance evaluation metrics, state-of-the-art approaches, and IoT legislation.

Technological advancements continue to enhance the field of engineering and have led to progress in branches that include electrical and mechanical engineering. These technologies have allowed for more sophisticated circuits and components while also advancing renewable energy initiatives. With increased growth in these fields, there is a need for a collection of research that details the variety of works being studied in our globalized world. The Handbook of Research on Recent Developments in Electrical and Mechanical Engineering is a pivotal reference source that discusses the latest advancements in these engineering fields. Featuring research on topics such as materials manufacturing, microwave photons, and wireless power transfer, this book is ideally designed for graduate students, researchers, engineers, manufacturing managers, and academicians seeking coverage on the works and experiences achieved in electrical and mechanical engineering.

This book bridges the divide between the fields of power systems engineering and computer communication through the new field of power system information theory. Written by an expert with vast experience in the field, this book explores the smart grid from generation to consumption, both as it is planned today and how it will evolve tomorrow. The book

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focuses upon what differentiates the smart grid from the "traditional" power grid as it has been known for the last century. Furthermore, the author provides the reader with a fundamental understanding of both power systems and communication networking. It shows the complexity and operational requirements of the evolving power grid, the so-called "smart grid," to the communication networking engineer; and similarly, it shows the complexity and operational requirements for communications to the power systems engineer. The book is divided into three parts. Part One discusses the basic operation of the electric power grid, covering fundamental knowledge that is assumed in Parts Two and Three. Part Two introduces communications and networking, which are critical enablers for the smart grid. It also considers how communication and networking will evolve as technology develops. This lays the foundation for Part Three, which utilizes communication within the power grid. Part Three draws heavily upon both the embedded intelligence within the power grid and current research, anticipating how and where computational intelligence will be implemented within the smart grid. Each part is divided into chapters and each chapter has a set of questions useful for exercising the readers' understanding of the material in that chapter. Key Features: Bridges the gap between power systems and communications experts Addresses the smart grid from generation to consumption, both as it is planned today and how it will likely evolve tomorrow Explores the smart grid from the perspective of traditional power systems as well as from communications Discusses power systems, communications, and machine learning that all define the smart grid It introduces the new field of power system information theory

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