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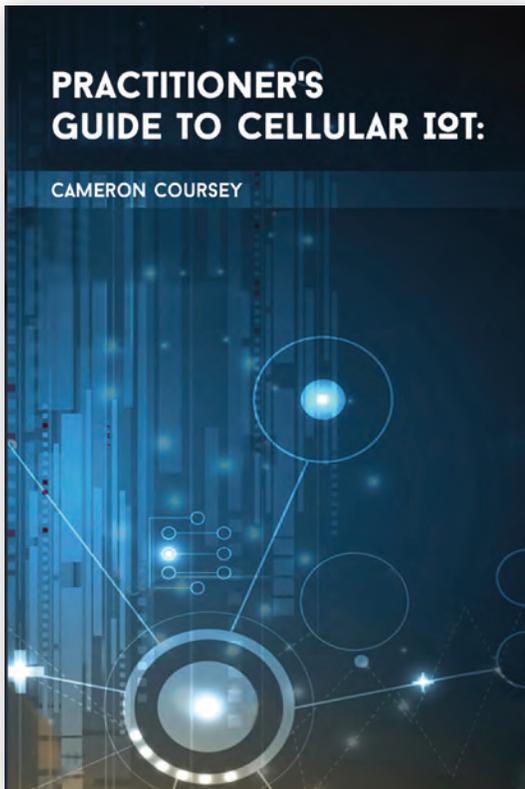
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COMING SOON!

Practitioner's Guide to Cellular IoT

Cameron Coursey

The Internet of Things (IoT) has grown from a niche market for machine-to-machine communication into a global phenomenon that is touching our lives daily. The key aspects of IoT are covered in this book, including the anatomy of an IoT device and how it is connected to a backend system, the nuances of data extraction and keeping the data safe and secure, the role of the SIM card in cellular connected IoT devices, and how IoT devices are controlled. Low-power wide-area devices that will allow almost anything to be connected, how IoT devices are being connected around the world, and how 5G and edge computing will continue to drive new use cases are explained. Overcoming the challenges of creating IoT applications and hardware is covered. Detailed examples of how IoT is being used in the spaces of industrial, consumer, transportation, robotics, and wearables are provided. The IoT industry is explained. Finally, the future of IoT is covered in light of technical, social, and economic advances.

**240 pp. • 2020 • eBook ISBN: 978-1-63081-808-1 • \$104 / £89
Print ISBN: 978-1-63081-807-4 • \$139 / £119**

DAVID B. CRUICKSHANK

IMPLEMENTING FULL DUPLEXING FOR 5G

"Finally, at the threshold of 5G cellular communications and their promise of the Internet of Things, machine-to-machine communication, self-driving cars, and faster-than-ever data, audio, and video communication, there is a complete text, written by an eminent expert in the industry, on the state of the art in full duplexing with respect to its physical implementation in transceivers."

– Prof. Rick Ubic, PhD, MInstP, Micron School #
of Materials Science and Engineering,
Boise State University

New!

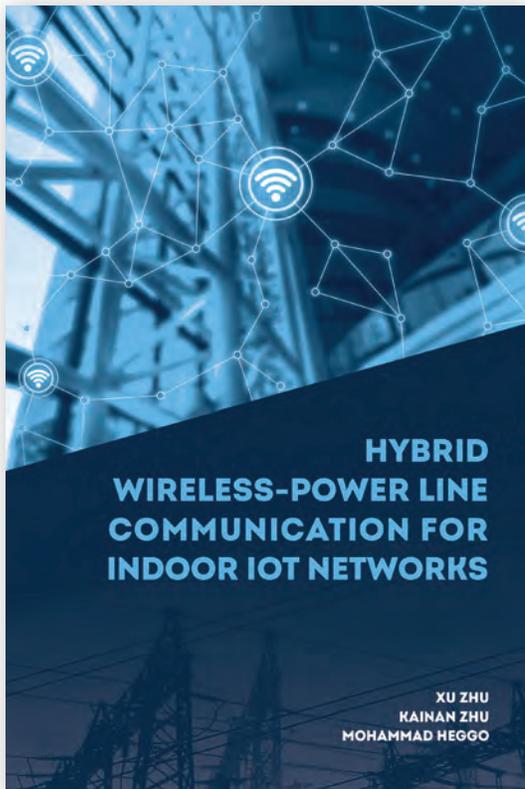
Implementing Full Duplexing for 5G

David B. Cruickshank

This book examines the current state of the art in developing full-duplex (FD) systems in 5G LTE cellular communications. Insight into FD transceivers in the entire 5G cell is provided along with how they affect cell equipment and device communications. This includes antennas, more sophisticated back- and front-hauling, relays, access points, base stations, and mobile phones, all of which could involve FD.

The book explores all forms of duplexers and their potential for size reduction and performance enhancement, including at millimetric frequencies. The relative merits of magnetic and nonmagnetic circulators are compared, examining the fundamental materials and device technologies that affect their size, S-parameters, and nonlinearity.

260 pp. • 2020 • eBook ISBN: 978-1-63081-696-4 • \$119 / £89
Print ISBN: 978-1-63081-695-7 • \$159 / £138



RECENT RELEASE!

Hybrid Wireless-Power Line Communication for Indoor IoT Networks

Xu Zhu, Kainan Zhu, and Mohammad Heggo

This authoritative resource covers the fundamentals of wireless and power line communication (PLC) technologies. Different types of wireless and PLC technologies used for indoor IoT applications are described. Channel models for wireless and PLC are introduced, highlighting the main challenges for these types of communications inside the indoor environment. The book explores hybrid technologies such as television white space (TVWS), very high frequency (VHF) wireless technology, and broadband PLC (BPLC) for indoor high-speed IoT networks. A TVWS standardized BPLC system is proposed, which integrates the requirement of primary user sensing and the permissible transmission power spectral density (PSD) for TVWS users into a BPLC standard, in relation to VHF band access.

**240 pp. • 2020 • eBook ISBN: 978-1-63081-810-4 • \$119 / £89
Print ISBN: 978-1-63081-809-8 • \$159 / £138**

TELECOMMUNICATION ELECTRONICS

Dante Del Corso • Vittorio Camarchia
Roberto Quaglia • Paolo Bardella

RECENT RELEASE!

Telecommunication Electronics

Dante Del Corso, Vittorio Camarchia,
Roberto Quaglia, and Paolo Bardella

This practical, hands-on resource describes functional units and circuits of telecommunication systems. The functions characterizing these systems, including RF amplifiers (both low noise and power amplifiers), signal sources, mixers and phase lock loops, are explored from an operational level viewpoint. And as all functions are migrating to digital implementations, this book describes functional units and circuits of telecommunication systems (with radio, wire, or optical links), from functional level viewpoint to the circuit details and examples. The structure of a radio transceiver is described and a view of all functional units, including migration to SDR (Software Defined Radio) is provided.

Chapters include a functional identification of the units described and analysis of possible circuit solutions and analysis of error sources. The sequence reflects the actual design procedure: functional identification, search and analysis of solutions, and critical review to provide an understanding of the various solutions and tradeoffs, with guidelines for design and/or selection of proper functional units.

260 pp. • 2020 • eBook ISBN: 978-1-63081-737-4 • \$134 / £116
Print ISBN: 978-1-63081-736-7 • \$179 / £155

Edward J. Birrane • Jason A. Soloff

Designing Delay-Tolerant Applications

for Store-and-Forward
Networks



RECENT RELEASE!

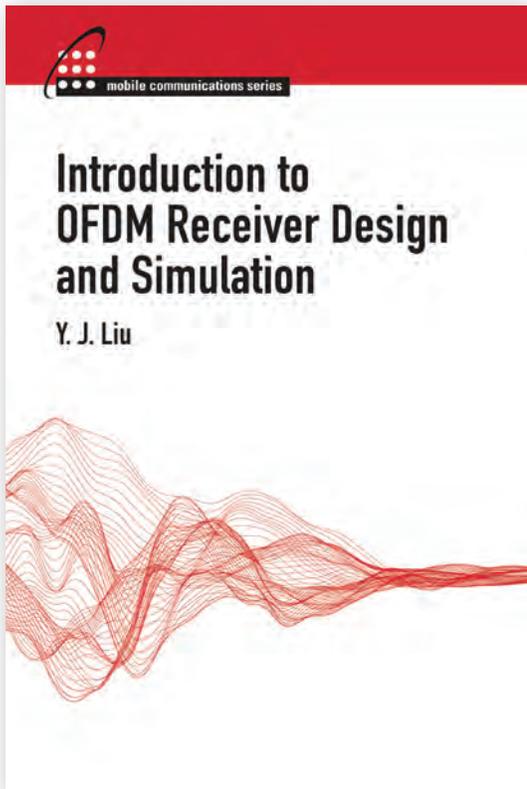
Designing Delay-Tolerant Applications for Store-and-Forward Networks

Ed J. Birrane and Jason A. Soloff

This comprehensive resource explains how network application engineers benefit from store-and-forward protocols. It reviews the motivation and design of delay tolerant networks (DTNs) and presents a series of design patterns, with examples, for developing and deploying delay-tolerant applications. The rationale for delay-tolerant applications as an evolution of standard solutions to current terrestrial internet networking challenges is presented. Similarities between internet architectures and DTN features are described, along with an overview of the history of DTNs, the architecture defining modern DTNs, and the Bundle Protocol transport mechanism.

The book identifies emerging, advanced networking concepts that require delay tolerance and presents network design patterns as a general way of reasoning about these concepts. Delay-tolerance is explained, and how it can be used to cache content in a network, perform open-loop autonomous control of nodes, annotate messages to reduce traffic needs, perform distributed error correction, implement in-network data fusion, and operationalize regional administration. The book discusses special considerations unique to DTNs that must be accommodated by delay-tolerant applications, examples of using these patterns, and a case study for their deployment.

**340 pp. • 2020 • eBook ISBN: 978-1-63081-630-8 • \$134 / £114
Print ISBN: 978-1-63081-628-5 • \$179 / £152**



RECENT RELEASE!

Introduction to OFDM Receiver Design and Simulation

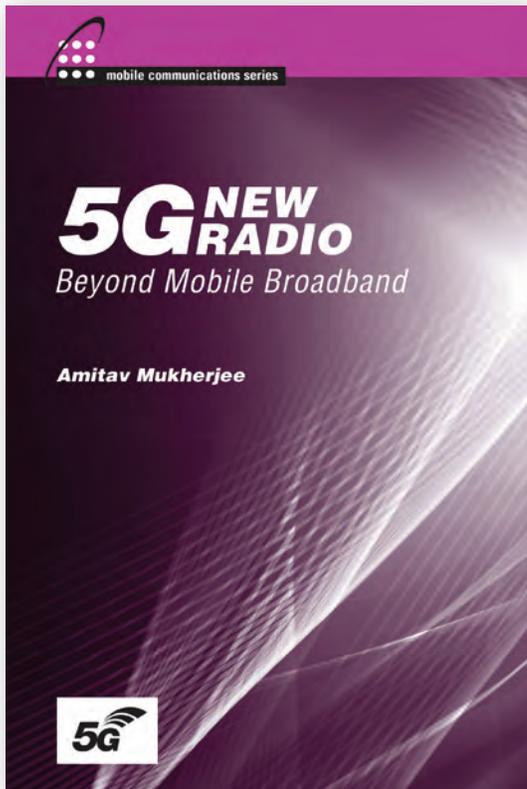
Y.J. Liu

This practical book is an accessible introduction to Orthogonal frequency-division multiplexing (OFDM) receiver design, a technology that allows digitized data to be carried by multiple carriers. It offers a detailed simulation study of an OFDM algorithm for Wi-Fi and 4G cellular that can be used to understand other OFDM waveforms. Extensive simulation studies are included using the transmission waveform given by the IEEE 802.11 standard. Scrambler, error-correcting codes, interleaver and radio-wave propagation model are included.

OFDM waveform characteristics, signal acquisition, synchronization issues, channel estimation and tracking, hard and soft decision decoding are all covered. Detailed derivations leading to the final formula for any algorithm are given, which allows the reader to clearly understand the approximations and conditions behind the formulas and apply them appropriately. The algorithms are selected not just for the best performance from simulation study but also for easy implementation. An example is a unique algorithm for signal acquisition using the principle of maximum likelihood detection.

The book is written in an easy to read fashion to provide a fundamental understanding of the OFDM algorithms. Examples are provided in many cases to help to understand the design subject. Digital signal processing is extensively used to explain the OFDM fundamentals.

**273 pp. • 2020 • eBook ISBN: 978-1-63081-739-8 • \$119 / £104
Print ISBN: 978-1-63081-738-1 • \$159 / £138**



"For researchers and practitioner interested in the potentials and promises of 5G, Mukherjee's book provides a well-motivated and clearly articulated guide tour over the wide landscape of 5G use cases and deployment adaptation techniques. After working through this book, the readers will gain insights into the flexibility of 5G and the system architect's way of thinking to address their own specific applications and scenarios."

– J.F. Thomas Cheng, PhD, Principal RF Engineer, #
Ericsson Research USA, Ericsson Inc.

RECENT RELEASE!

5G New Radio: Beyond Mobile Broadband

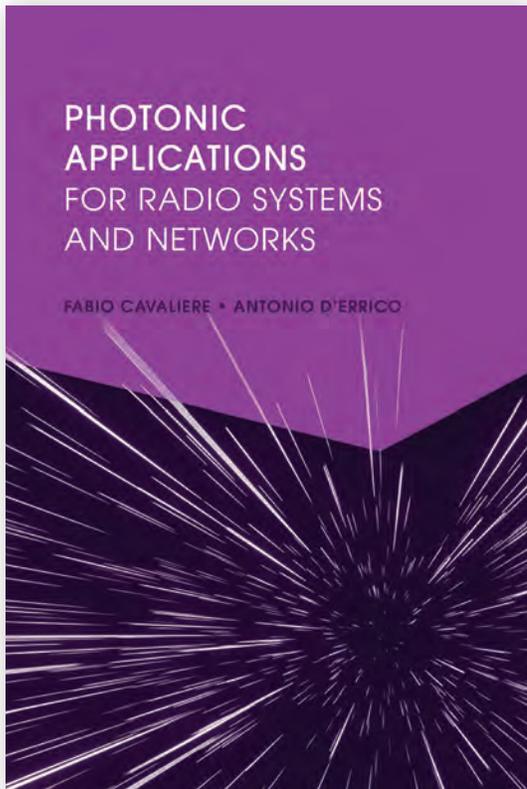
Amitav Mukherjee

Fifth-generation cellular radio access networks are currently being standardized as 5G New Radio (NR). The primary objectives of 5G NR are to provide enhanced mobile broadband (eMBB) and ultra-reliable low latency communication (URLLC) capabilities. This innovative resource analyzes these applications in detail to help readers understand how the flexible design of NR makes it suitable for a wide range of use cases and applications. The rationale behind the design decisions made during the NR standardization process are explored. Readers will be able to understand the performance limits of NR when applied to non-eMBB scenarios and how NR compares to 4G and IEEE 802.x connectivity solutions for such scenarios.

The main features of 5G phase 2 are explored, as well as the use cases that can be addressed by 5G phase 2. The mathematical models are included to help explain the future evolution of NR in Release 16 and beyond. This is the only book that describes both the standards features of NR and the mathematical models/open research issues for 5G, appealing to both industry practitioners and academic researchers.

**316 pp. • 2019 • eBook ISBN: 978-1-63081-642-1 • \$104 / £89
Print ISBN: 978-1-63081-640-7 • \$139 / £119**

RECENT RELEASE!



Photonic Applications for Radio Systems Networks

Fabio Cavaliere and Antonio D'Errico

This hands-on, practical new resource provides optical network designers with basic but necessary information about radio systems air interface and radio access network architecture, protocols, and interfaces, using 5G use cases as relevant example. The book introduces mobile network designers to the transmission modeling techniques for the design of a radio access optical network. The main linear and non-linear propagation effects in optical fiber are covered. The book introduces mobile network designers to the optical technologies used in digital and analog radio access networks, such as optical amplifiers and transmitters, and describes different deployment scenarios, including point-to-point fiber systems, wavelength-division multiplexing systems, and passive optical networks. New integrated photonic technologies for optical switching are also discussed. The book illustrates the principles of optical beamforming and explains how optical technologies can be used to provide accurate phase and frequency control of antenna elements.

The new architecture of the optical transport network, driven by the new, challenging requirements that 5G poses in terms of high capacity, high energy efficiency, low latency and low cost is discussed. The use of photonic devices to perform tasks as radio-frequency generation and beamforming, with improved accuracy and cost compared to traditional electronic systems, especially when moving to mm-waves is also explored. Readers also learn the replacement of electric interconnect systems with higher speed and more energy efficient optical lines to perform more effectively computationally demanding baseband processing in 5G. All presented propagation models can be implemented in a spreadsheet, in order to provide the designer with simple rules of thumbs for network planning.

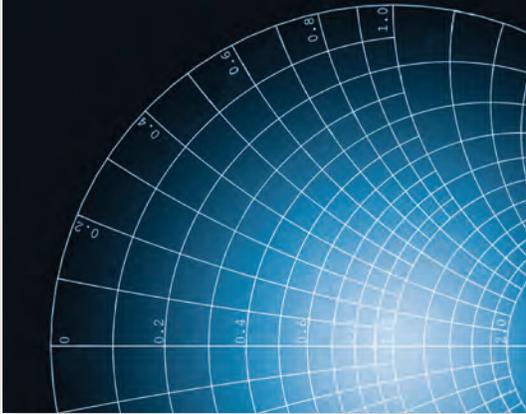
**301 pp. • 2019 • eBook ISBN: 978-1-63081-666-7 • \$127 / £104
Print ISBN: 978-1-63081-665-0 • \$169 / £139**

"Photonic Applications for Radio Systems and Networks" is a comprehensive source of information related to radio systems and networks as well as photonic switching and optical transmission systems, and optical networks. Besides, it gives a practical advices and theoretical background in this broad technology area, allowing the interested reader to understand the properties of the involved systems and networks. The book can be used as a text book for both basic and advances courses."

**– Lena Wosinska, Professor of Telecommunication,
Chalmers University of Technolog,
Founder of the Optical Networks Lab**

The VNA Applications Handbook

Gregory Bonaguide • Neil Jarvis



"This is an excellent book that explains the fundamentals of the Vector Network Analyzer and detailed information on each measurement types. The book explains each measurement method in great detail including the system calibration techniques which aid you to understand the benefits and limitations of the measurement types. This is a highly recommended book for engineers who use Vector Network Analyzers for their work."

– Chris Lee, Principal RF Engineer, #
Apptronics LLC

RECENT RELEASE!

The VNA Applications Handbook

Gregory Bonaguide and Neil Jarvis

Written by prominent experts in the field, this authoritative new resource provides guidelines for performing a wide variety of Vector Network Analyzers (VNA) measurements. The capabilities and limitations of modern VNA in the context of challenging real-world applications are explained, as well as insights for optimizing test setups and instrument settings, making accurate measurements and, equally important, avoiding costly mistakes.

Organized by topic, the readers can focus on chapters covering particular measurement challenges.

Application topics include linear and non-linear measurements of passive and active devices, frequency converting devices, and special considerations for high-power, high-gain, and pulsed devices.

Signal Integrity and time-domain reflectometry are covered, as well as emerging applications at millimeter-wave frequencies driven by 5G and automotive radar.

Waveguide is presented, with emphasis on understanding guided-wave propagation and the associated calculations required for creating calibration standards. Each application is supported by illustrations that help explain key concepts and VNA screenshots are used to show both expected and, in some cases, unexpected results. This book equips engineers and lab technicians to better understand these important instruments, and effectively use them to develop the technologies that drive our world.

400 pp. • 2019 • eBook ISBN: 978-1-63081-602-5 • \$127 / £104
Print ISBN: 978-1-63081-600-1 • \$169 / £139

Anechoic Range Design for Electromagnetic Measurements

Vince Rodriguez



"I truly believe that this book will soon become a must and an essential consulting material in the engineering school libraries as well as part of the stuff of engineers and technologists devoted to testing and measurements in anechoic sites of equipment, components or systems."

– Dr. Israel Garcia-Ruiz, Director for the Metrology in Radiofrequencies Area, # National Center for Metrology, CENAM

RECENT RELEASE!

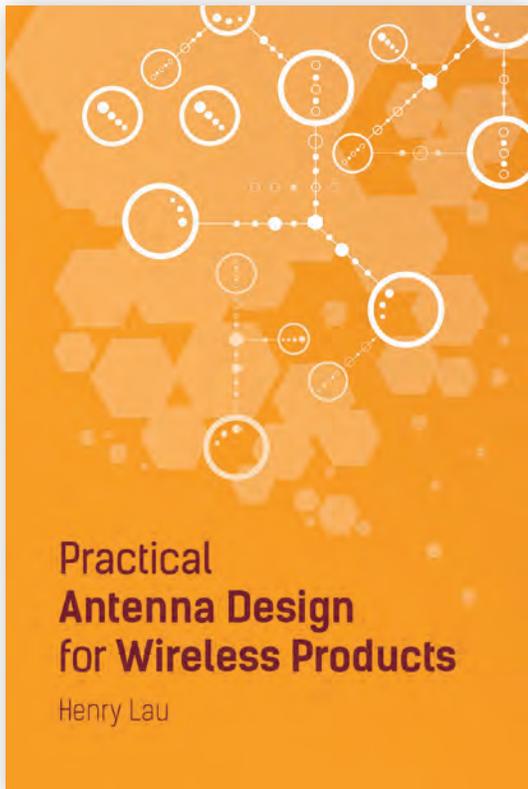
Anechoic Range Design for Electromagnetic Measurements

Vince Rodriguez

As technologies for wireless communications, including 5G and Internet of Things (IoT), require more complex antennas, practitioners need more information on the best methods to perform measurements on these different types of antennas. This exciting resource provides guidance on the proper design of indoor ranges for RF antenna measurements. The important aspects of specifying the range or resources needed in a development program are explored. Analysis of existing ranges to determine their suitability for performing specific test that a user of the range may require is also introduced. Readers find in-depth coverage of the design of ranges and how to evaluate the error contributions of the range and the best approach to measure a system, antenna, or other radiating hardware.

The book provides information on selecting the right range to make a specific type of measurement and understanding for an RF absorber. Matlab scripts are also included to help readers estimate the performance of an RF absorber. Readers will be able to estimate the required space for a given type of measurement, as well as identify what type of range is the better choice, based on physical limitations and economics. Simple rules for the design of an anechoic chamber, based on the required accuracy and parameters to be measured are described. Packed with examples and references, this book is a prime reference for any practitioner that uses or designs facilities for the measurement of electromagnetic energy.

**416 pp. • 2019 • eBook ISBN: 978-1-63081-539-4 • \$127 / £104
Print ISBN: 978-1-63081-537-0 • \$169 / £139**



"Mr. Henry Lau's text is designed to fit between the classical books on antenna design used in an academic setting and the engineer who must come quickly to determine his approach to a pressing antenna solution. The major feature of this book is that it sets the reader in the proper direction when faced with the design of a compact system in for example the "Internet of things."

– **W. Alan Davis, Electrical Engineering Dept.,
University of Texas at Arlington**

RECENT RELEASE!

Practical Antenna Design for Wireless Products

Henry Lau

This comprehensive resource covers both antenna fundamentals and practical implementation strategies, presenting antenna design with optimum performance in actual products and systems. The book helps readers bridge the gap between electromagnetic theory and its application in the design of practical antennas in real products. Practical implementation strategies in products and systems will be addressed in order to design antennas in the context of actual product environments, including PCB layout, component placement and casing design. Practical design examples on wearable electronic products are presented with a systematic approach to designing antennas for actual products.

The book introduces antenna fundamentals to provide the basic concepts and necessary mathematics on electromagnetic analysis, followed by advanced antenna elements. The concept of electromagnetic simulation is presented. The advantages and disadvantages of different numerical methods in antenna modeling are also discussed. Several commercial antenna design and simulation tools are introduced, allowing hands-on practice of antenna modeling and simulation.

**230 pp. • 2019 • eBook ISBN: 978-1-63081-326-0 • \$104 / £89
Print ISBN: 978-1-63081-325-3 • \$139 / £119**

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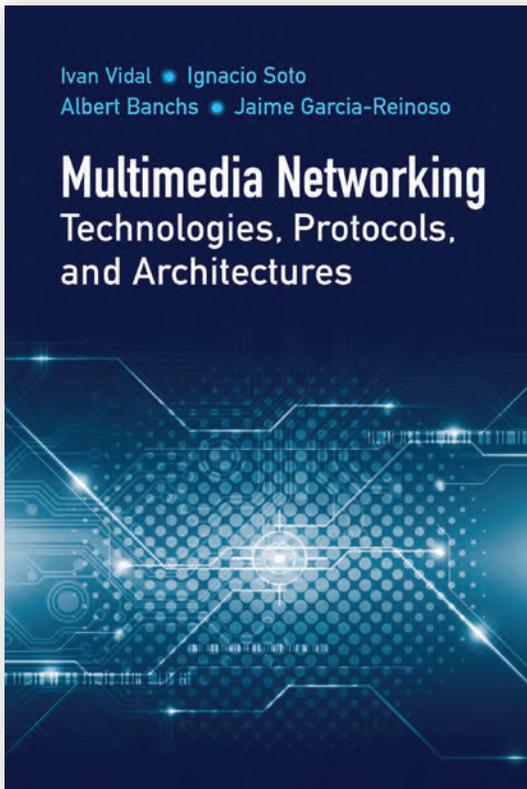
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The Great Telecom Meltdown
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Introduction to Communication Networks
Building the FirstNet Public Safety Broadband Network
Creating Value-Added Services and Applications for Converged Communications Networks
Telecommunication Networks for the Smart Grid
IoT Technical Challenges and Solutions
The ABCs of Fiber Optic Communication
Delay-Tolerant Satellite Networks
High-Efficiency Load Modulation Power Amplifiers for Wireless Communications
The Technical Foundations of IoT
Third Networks and Services
Interference and Resource Management in Heterogeneous Wireless Networks
From LTE to LTE-Advanced Pro and 5G
Software-Defined Radio for Engineers
Signal Digitization and Reconstruction in Digital Radios
Military Communications in the Future Battlefield
5G and Satellite Spectrum, Standards, and Scale
Design Solution for Wireless Sensor Networks in Extreme Environments
Multimedia Networking Technologies, Protocols, & Architectures
Anechoic Range Design for Electromagnetic Measurements
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Implementing Full Duplexing for 5G
Location Based Services in Cellular Networks: from GSM to 5G NR

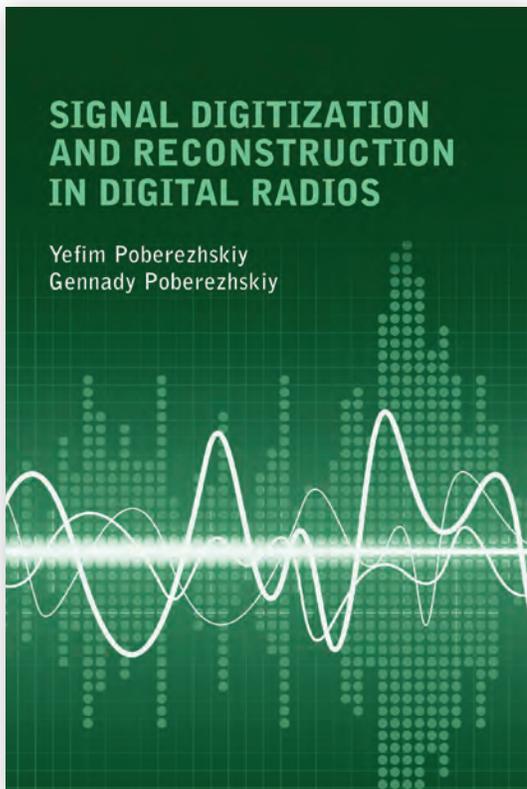


Multimedia Networking Technologies, Protocols, and Architectures

Ivan Vidal, Ignacio Soto, Albert Banchs, and Jaime Garcia-Reinoso

This practical resource provides a survey on the technologies, protocols, and architectures that are widely used in practice to implement networked multimedia services. The book presents the background and basic concepts behind multimedia networking, and provides a detailed analysis of how multimedia services work, reviewing the diverse network protocols that are of common use to implement them. To guide the explanation of concepts, the book focuses on a representative set of networked multimedia services with proven success and high penetration in the telecommunication market, namely Internet telephony, Video-on-Demand (VoD), and live IP television (IPTV).

300 pp. • 2019 • eBook ISBN: 978-1-63081-379-6 • \$112 / £97
Print ISBN: 978-1-63081-378-9 • \$149 / £129



Signal Digitization and Reconstruction in Digital Radios

Yefim Poberezhskiy and Gennady Poberezhskiy

This comprehensive resource provides the latest information on digitization and reconstruction (D&R) of analog signals in digital radios. Readers learn how to conduct comprehensive analysis, concisely describe the major signal processing procedures carried out in the radios, and demonstrate the dependence of these procedures on the quality of D&R. The book presents and analyzes the most promising and theoretically sound ways to improve the characteristics of D&R circuits and illustrate the influence of these improvements on the capabilities of digital radios.

340 pp. • 2018 • eBook ISBN: 978-1-63081-401-4 • \$119 / £104
Print ISBN: 978-1-63081-380-2 • \$159 / £138

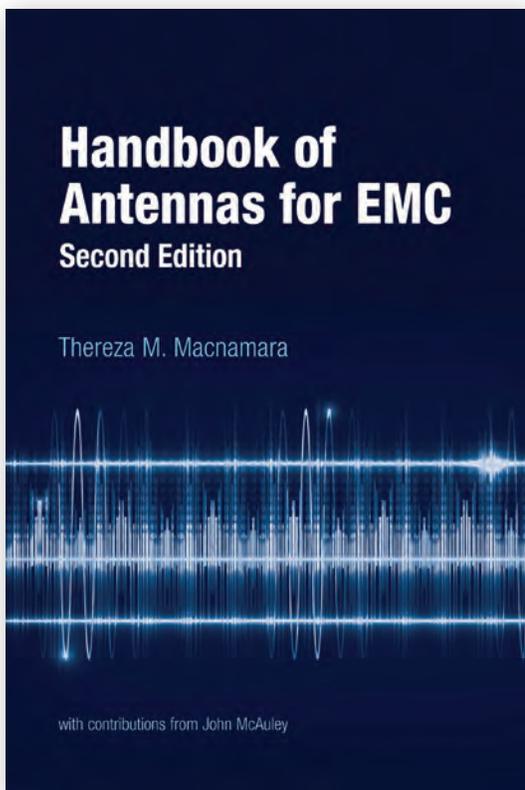


Design Solutions for Wireless Sensor Networks in Extreme Environments

Habib F. Rashvand and Ali Abedi

This innovative resource introduces new approaches to diversify the practical use of wireless sensor networks. The book explores ways to incorporate wireless sensing techniques for use in unconventional environments, including harsh industrial working conditions, space, underwater and underground, using heterogeneous, agile and unconventional methods. It explores system challenges of working in these extreme locations, as well as designing for longevity, electronics and hardware issues, and facilitating information-flow in hard to reach areas. Readers gain an understanding of throughput and interference trade-offs in these challenging environments.

380 pp. • 2018 • eBook ISBN: 978-1-63081-178-5 • \$112 / £97
Print ISBN: 978-1-63081-177-8 • \$149 / £129

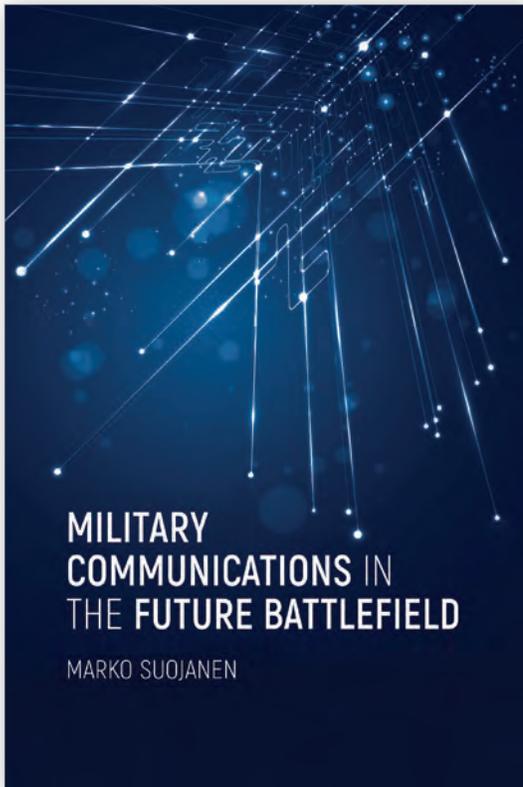


Handbook of Antennas for EMC, Second Edition

Thereza M. MacNamara and John McAuley

Finally - a completely revised, updated, and expanded edition of the Artech House classic, *Handbook of Antennas for EMC*. The second edition features a wealth of brand new material, including chapters on recent techniques, standards, and measurements. This invaluable resource provides a thorough understanding of the practical aspects and underpinnings of antennas in EMC systems. Professionals find summaries of important underlying mathematics without the heavy theoretical emphasis that characterizes much of the existing literature. Professionals discover which antennas to choose for electromagnetic (EM) compatibility and compliance.

380 pp. • 2018 • eBook ISBN: 978-1-63081-426-7 • \$127 / £110
Print ISBN: 978-1-63081-424-3 • \$169 / £146

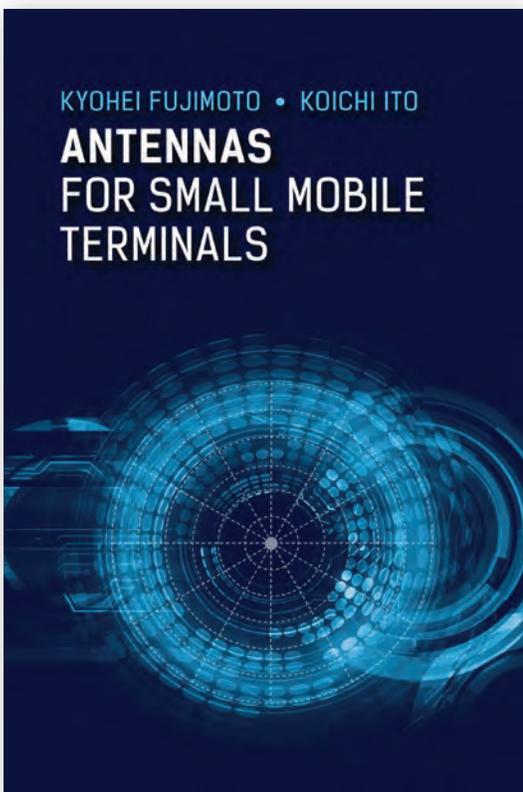


Military Communications in the Future Battlefield

Marko Suojanen

Taking an applications-oriented view, this unique volume delivers a forward-looking roadmap to military communications. This hands-on reference offers military and security technology practitioners insights into the key issues related to long-term development within the battlefield communications area. The book presents the technological alternatives for communication in the battlefield in unexpected situations and environments. This authoritative resource discusses unstructured formations of actors using a holistic approach that considers key capability requirements. Professionals and officers learn how to prepare for the unexpected and start building agile, adaptive and cognitive systems that are needed in future operating environments.

228 pp. • 2018 • eBook ISBN: 978-1-63081-606-3 • \$104 / £89
Print ISBN: 978-1-63081-333-9 • \$139 / £119

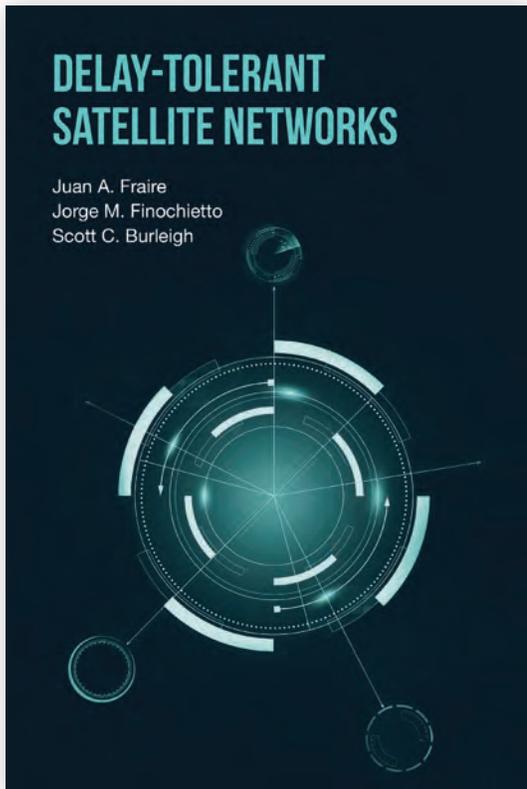


Antennas for Small Mobile Terminals

Kyohei Fujimoto and Koichi Ito

With the progress and rapid increase in mobile terminals, the design of antennas for these small systems is becoming more and more important. This forward-looking volume offers professionals current and comprehensive coverage of the design, development, and implementation of small, compact, and lightweight antennas in mobile communication terminals. The book discusses a wide range of communication systems, from Radio-frequency identification (RFID), and near field communications (NFC), to wireless power transmission (WPT) and broadband wireless networks. Engineers learn how to use small antennas in mobile phones, wearable systems, laptop computers, radio watches, and broadband wireless networks such as WLAN and WiMAX.

340 pp. • 2018 • eBook ISBN: 978-1-63081-521-9 • \$127 / £104
Print ISBN: 978-1-63081-095-5 • \$169 / £139

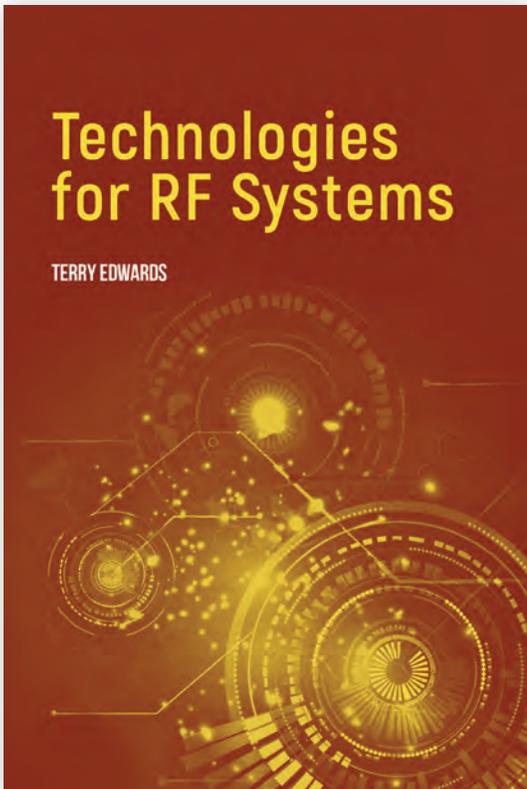


Delay-Tolerant Satellite Networks

Juan A. Fraire, Jorge M. Finochietto,
and Scott C. Burleigh

This cutting-edge resource provides a comprehensive treatment of applying delay-tolerant networking (DTN) principles to satellite-based network communications. Detailed models and analytical tools are used to evaluate performance and provide guidance in the field. This book presents the state-of-the-art in existing on-board and ground technologies that support satellite applications, such as communications protocols, algorithms, and security procedures. Readers gain key insight into the fundamental concepts of DTN applied to satellite networks (DTSNs) and case studies are provided. This book presents an authoritative introduction to the methods for computing metrics for satellite network modeling.

272 pp. • 2017 • eBook ISBN: 978-1-63081-517-2 • \$112 / £97
Print ISBN: 978-1-63081-344-4 • \$149 / £129

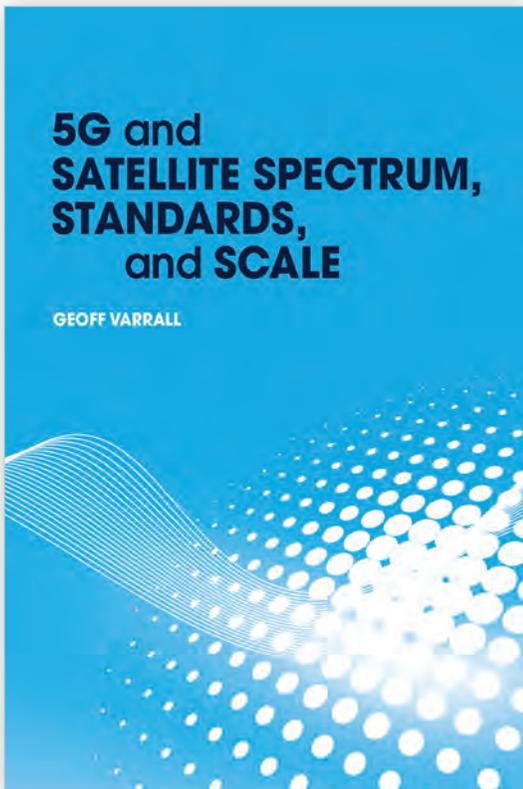


Technologies for RF Systems

Terry Edwards

This comprehensive resource provides an introduction to the main concepts, technologies, and components in microwave and RF engineering. This book presents details about how to design various amplifiers, circuits, and chips for communication systems. It offers insight into selecting appropriate ADC and DAC technology. Several worked examples are found throughout the book. This book provides a summary of 21st century RF systems and electronics and discusses the challenges of frequency bands and wavelengths, software-defined radio (SDR) and cognitive radio. RF semiconductors are covered, including bandgap, drift velocity, resistors, diodes, and various transistors. This book offers details about passive RF components, capacitors, inductors, resistors, coaxial, and microstrip lines as well as coplanar waveguide.

330 pp • 2018 • eBook ISBN: 978-1-63081-452-6 • \$119 / £104
Print ISBN: 978-1-63081-450-2 • \$138 / £138

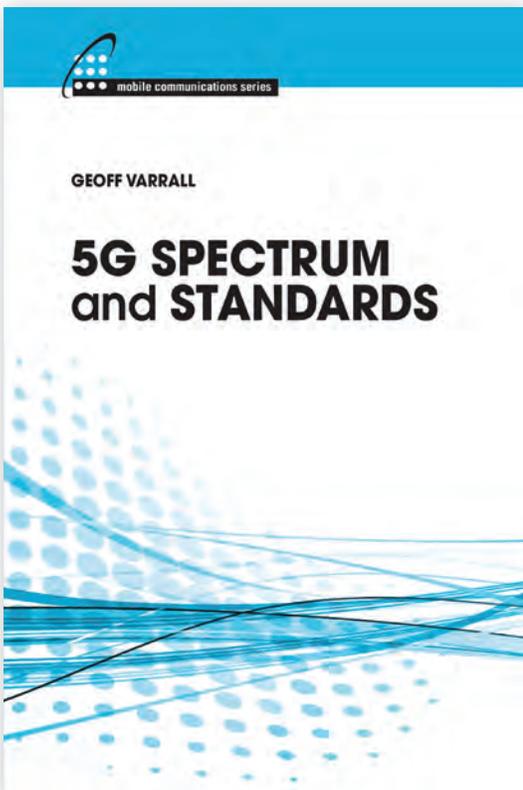


5G and Satellite Spectrum, Standards, and Scale

Geoff Varrall

This new resource presents the emerging role of Low Earth Orbit (LEO), Medium Earth Orbit (MEO), and Geostationary satellites (GSO) as a delivery option for backhaul and wide area rural and urban mobile broadband and fixed access. The book offers insight into recently established Non Terrestrial Network standards. Readers learn which bands will need to be supported in next generation 5G and satellite devices and networks and how the bands will be characterized. Channel spacing, guard bands, FDD or TDD, out of band emission limits, and in band performance requirements are discussed. Readers learn how modulation choices will affect co-existence issues.

**310 pp. • 2018 • eBook ISBN: 978-1-63081-504-2 • \$127 / £104
Print ISBN: 978-1-63081-502-8 • \$169 / £139**

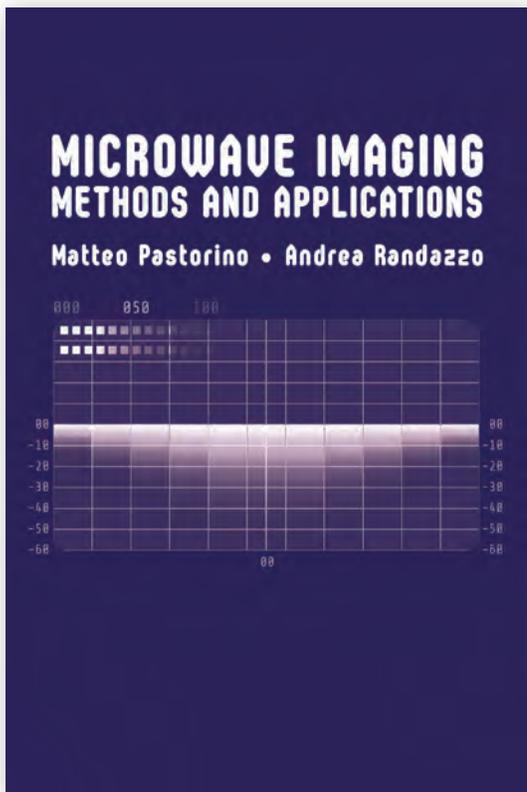


5G Spectrum and Standards

Geoff Varrall

This new resource provides key insight into future 5G radio systems and the technical and economic impact on industries, communities and end-users. The book offers a comprehensive understanding of the options available for teams tasked with bringing 5G products and services to market or developing supporting standards and regulatory frameworks. Readers find contemporary examples of millimeter band radio hardware including 60 GHz and V band and E Band point to point radio. This book demonstrates the profound progress with 4G radio signal processing and RF hardware to reveal its potential applicability to 5G radio systems.

**360 pp. • 2016 • eBook ISBN: 978-1-63081-366-6 • \$112 / £97
Print ISBN: 978-1-63081-044-3 • \$149 / £129**

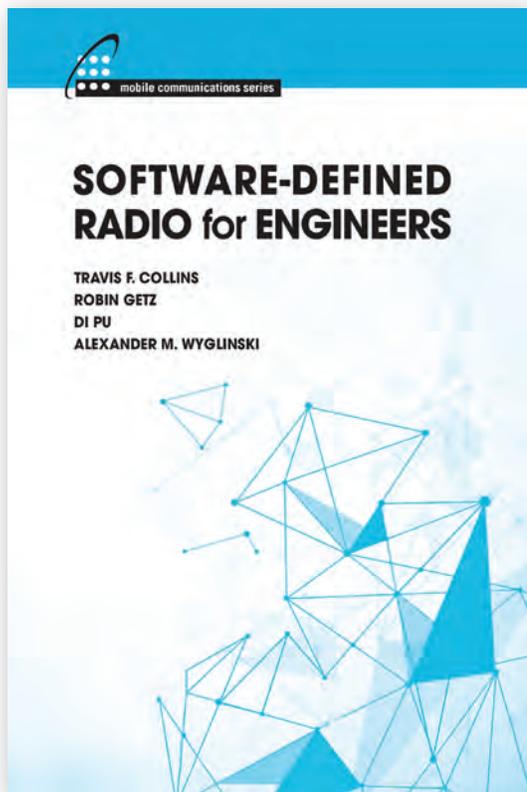


Microwave Imaging Methods and Applications

Matteo Pastorino and Andrea Randazzo

Microwave Imaging Methods and Applications provides practitioners and researchers with a complete overview of the latest and most important noninvasive and nondestructive techniques for inspecting structures and bodies by using microwaves. Placing emphasis on applications, the book considers many areas, from medical imaging and security... to industrial engineering and subsurface prospection. For each application, readers are presented with the objectives of the inspection and related challenges. Moreover, this groundbreaking resource details computational methods that can be used to solve inverse problems related to specific applications.

310 pp. • 2018 • eBook ISBN: 978-1-63081-526-4 • \$119 / £104
Print ISBN: 978-1-63081-348-2 • \$159 / £138

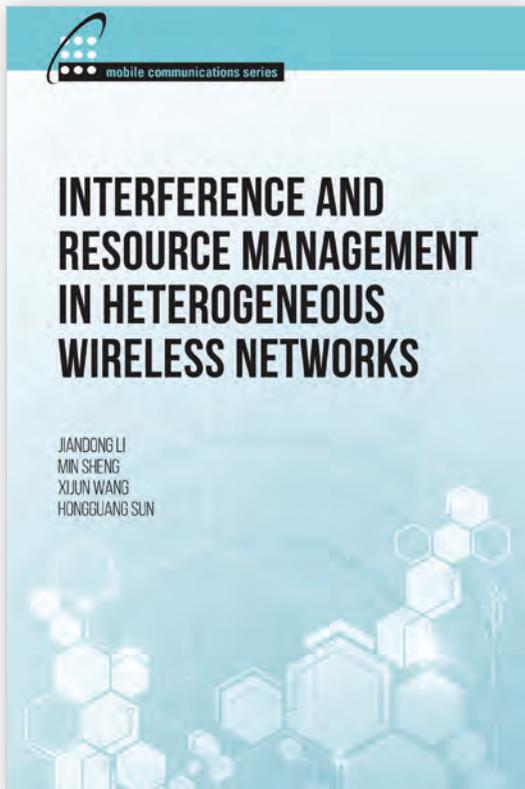


Software-Defined Radio for Engineers

Travis F. Collins, Robin Getz, Di Pu,
and Alexander M. Wyglinski

Based on the popular Artech House classic, *Digital Communication Systems Engineering with Software-Defined Radio*, this book provides a practical approach to quickly learning the software-defined radio (SDR) concepts needed for work in the field. This up-to-date volume guides readers on how to quickly prototype wireless designs using SDR for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well as various processing technologies.

378 pp. • 2018 • eBook ISBN: 978-1-63081-459-5 • \$119 / £104
Print ISBN: 978-1-63081-457-1 • \$159 / £138

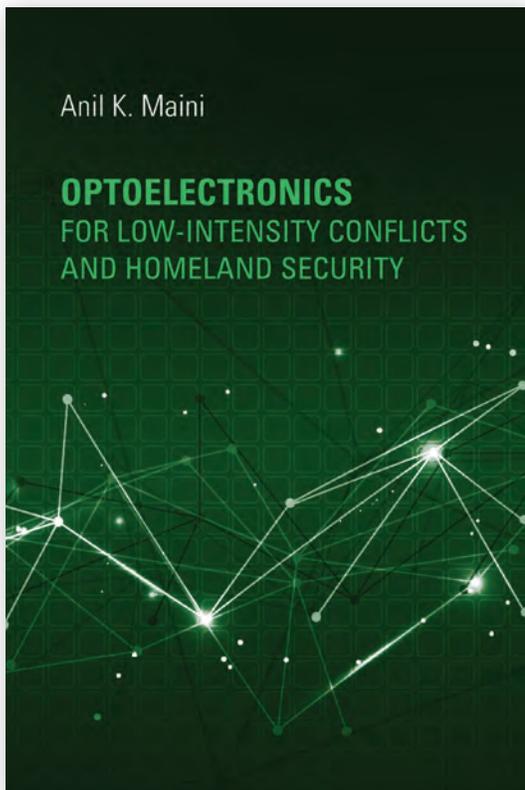


Interference and Resource Management in Heterogeneous Wireless Networks

Jiandong Li, Min Sheng, Xijun Wang,
and Hongguang Sun

This authoritative resource offers a comprehensive overview of heterogeneous wireless networks, small cells, and device-to-device (D2D) communications. The book provides insight into network modeling and performance analysis of heterogeneous wireless networks. Interference management framework and design issues are covered as well as details about resource mobility, channel models, and typical and statistical interference modeling. This resource explains leveraging resource heterogeneity in interference mitigation and presents the challenges and feasible solutions for concurrent transmission.

224 pp. • 2017 • eBook ISBN: 978-1-63081-509-7 • \$104 / £89
Print ISBN: 978-1-63081-340-6 • \$139 / £119

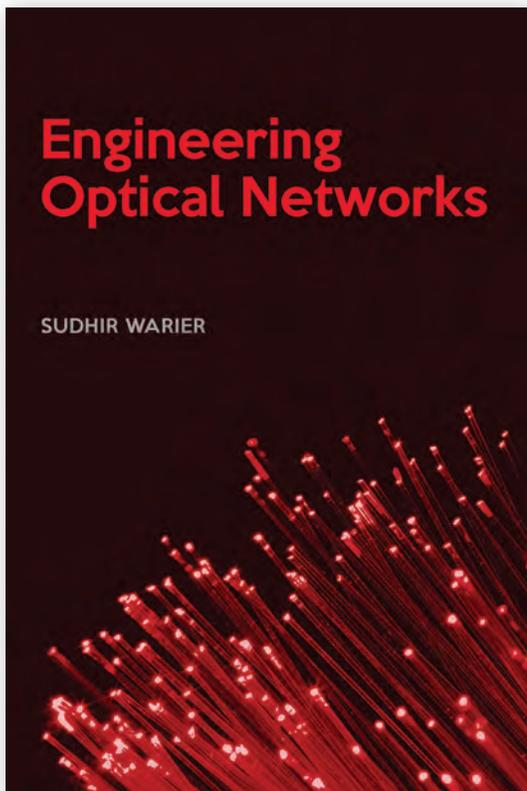


Optoelectronics for Low-Intensity Conflicts and Homeland Security

Anil Maini

This authoritative new resource provides an overview of the deployment of various devices in systems in actual field conditions and efficacy established in warfare. The book covers laser and optronic technologies that have evolved over the years to build practical devices and systems for use in Homeland Security and low-intensity conflict scenarios. Readers will be able to assess combat and battle-worthiness of various available devices and systems. This book covers state-of-the-art and emerging trends in various optoelectronics technologies having applications in Homeland Security.

360 pp. • 2018 • eBook ISBN: 978-1-63081-572-1 • \$134 / £116
Print ISBN: 978-1-63081-570-7 • \$179 / £155

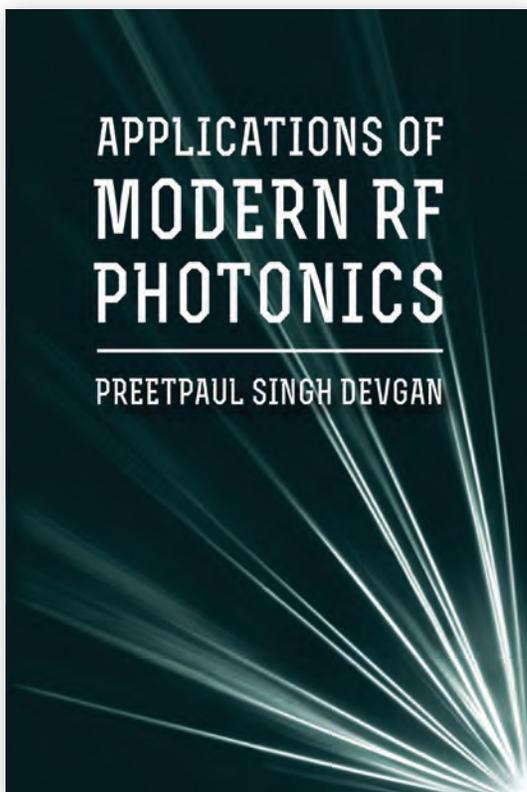


Engineering Optical Networks

Sudhir Warier

Written by a leading expert in the field, this book provides a comprehensive introduction to the fundamental concepts of transport and data networks. This resource examines backbone network architectures and functions. The evolution, key components, and techniques of telecommunication networks are presented, including voice and data transmission, fiber optic communication and optical link design. This book explores the photonic network architecture and includes chapters on transport networks, synchronous optical networks, optical transport networks, and dense wavelength division multiplexing. Professionals are brought up-to-speed with the applications and architecture of next generation photonic networks, and are provided with references for all applicable standards.

400 pp. • 2017 • eBook ISBN: 978-1-63081-449-6 • \$119 / £104
Print ISBN: 978-1-63081-447-2 • \$159 / £138

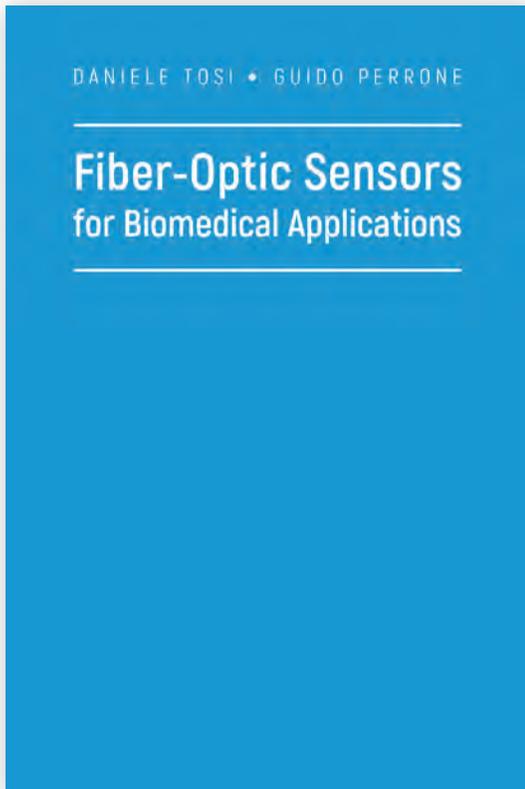


Applications of Modern RF Photonics

Preetpaul Singh Devgan

This unique new resource presents applications of modern RF photonic systems that use RF photonic components for commonly used signal processing systems. This book provides insight into how a variety of systems work together, including RF down conversion, analog to digital conversion, RF oscillators, and frequency identification. A comparison of analog versus digital systems is presented. Readers find in-depth coverage of analog delay lines using RF photonics, various system architectures, and details about RF photonic component performance. Signal processing utilizing RF photonics and the need for down conversion is discussed. The many advancements in analog delay line performance are explained, including those in photodetector, optical fibers, and optical and amplifier modulators.

230 pp. • 2018 • eBook ISBN: 978-1-63081-524-0 • \$119 / £104
Print ISBN: 978-1-63081-159-4 • \$159 / £138

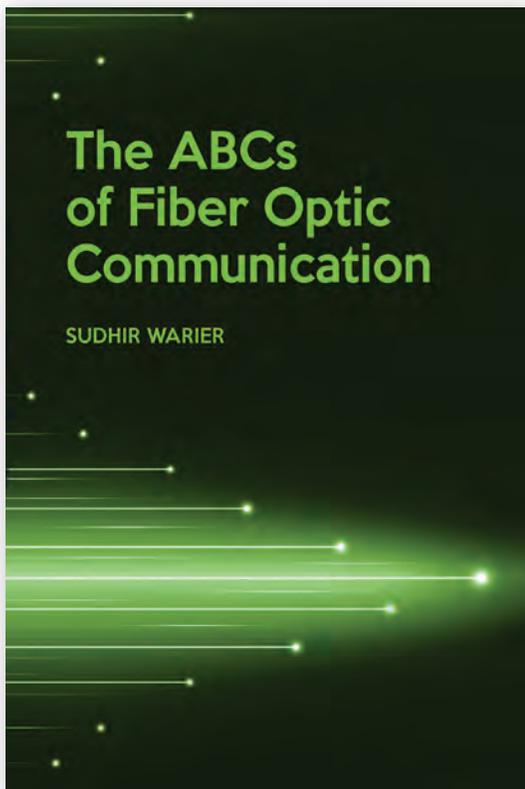


Fiber-Optic Sensors for Biomedical Applications

Daniele Tosi and Guido Perrone

This authoritative new resource presents fiber optic sensors and their applications in medical device design and biomedical engineering. Readers gain an understanding of which technology to use and adopt, and how to connect technologies with their respective applications. This book explores the innovation of diagnostics and how to use diagnostic tools. Principles of fiber optic sensing are covered and include details about intensity-based sensors, fiber bragg gratings, distributed sensors, and fabry-perot interferometers. This book explores interrogation software, standards for medical sensors, and discusses protocols and tools for validation.

330 pp. • 2017 • eBook ISBN: 978-1-63081-495-3 • \$127 / £104
Print ISBN: 978-1-60807-152-5 • \$169 / £139

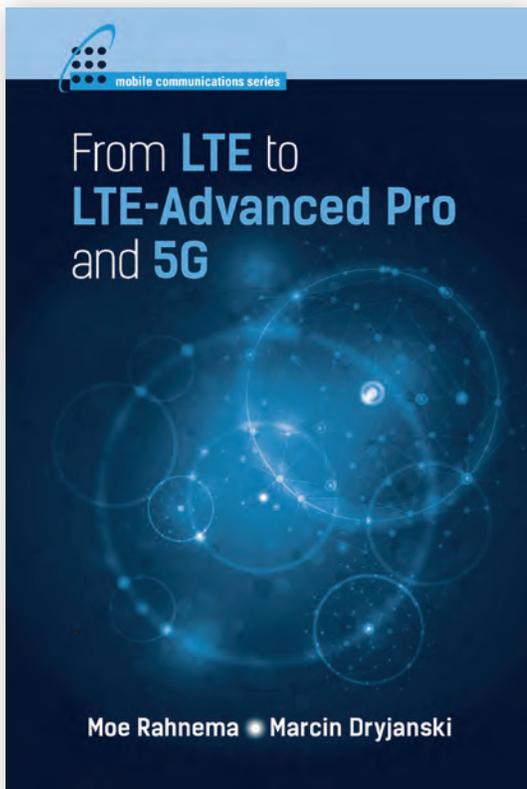


The ABCs of Fiber Optic Communication

Sudhir Warier

This unique practical handbook is the only one of its kind to provide the conceptual framework and troubleshooting tactics related to the manufacturing, selection, and installation of modern photonic networks, including optical fiber plants, optical transceivers, test and measurement equipment, and network architecture of SDH, OTN, IP/MPLS, FTTx networks, and PON. This resource includes the latest technological advancements and industry applications while covering the entire fiber ecosystem from installation to troubleshooting. This book also provides an overview of the current and future developments in optical fibers, interfaces, transceivers and backbone networks.

322 pp. • 2017 • eBook ISBN: 978-1-63081-416-8 • \$112 / £97
Print ISBN: 978-1-63081-414-4 • \$149 / £129

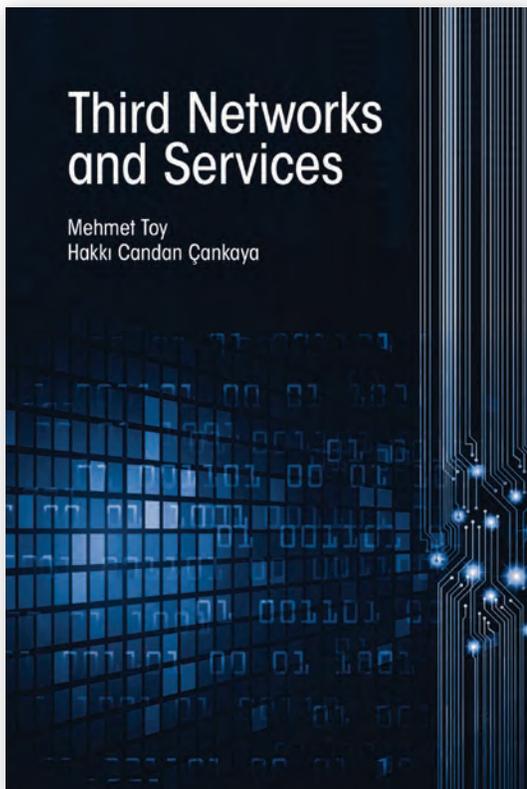


From LTE to LTE-Advanced Pro and 5G

Moe Rahnema and Marcin Dryjanski

This practical hands-on new resource presents LTE technologies from end-to-end, including network planning and the optimization tradeoff process. This book examines the features of LTE-Advanced and LTE-Advanced Pro and how they integrate into existing LTE networks. Professionals find in-depth coverage of how the air interface is structured at the physical layer and how the related link level protocols are designed and work. This resource highlights potential 5G solutions as considered in releases 14 and beyond, the migration paths, and the challenges involved with the latest updates and standardization process.

372 pp. • 2017 • eBook ISBN: 978-1-63081-455-7 • \$104 / £89
Print ISBN: 978-1-63081-453-3 • \$139 / £119

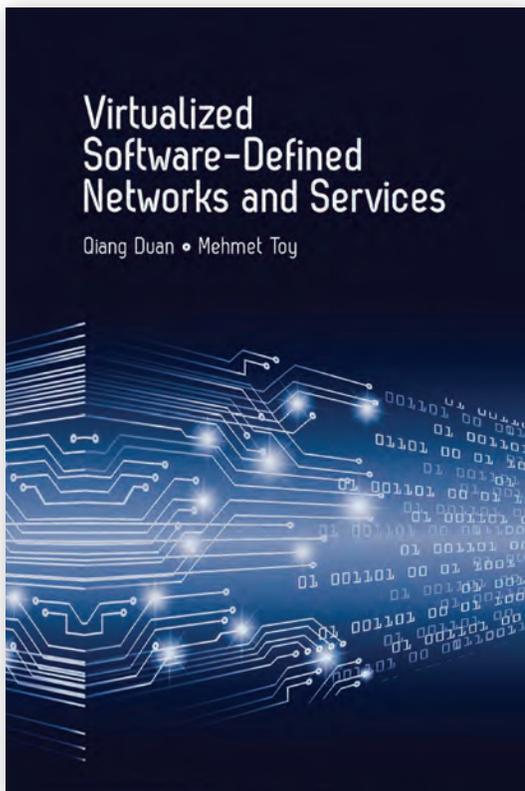


Third Networks and Services

Mehmet Toy and Hakki Candan Cankaya

This comprehensive new resource presents applications of MEF's (Metro Ethernet Forum) Carrier Ethernet architecture and provides insight into building end-to-end systems with third network services like MPLS-TP, VPLS, and PBT. This book includes new use cases and explores the new MEF/CEN specifications, services, and applications. While providing a look into lifecycle service orchestration (LSO), virtualization, and cloud series, this book highlights the pros and cons of these technologies for service providers and enterprise network owners.

544 pp. • 2017 • eBook ISBN: 978-1-63081-430-4 • \$127 / £77
Print ISBN: 978-1-63081-175-4 • \$118 / £89

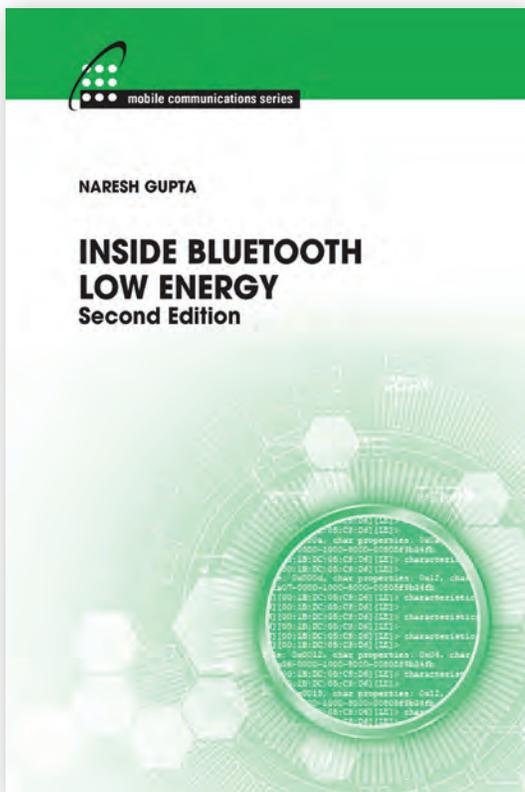


Virtualized Software-Defined Networks and Services

Qiang Duan and Mehmet Toy

This comprehensive new resource presents the latest developments in key Software-Defined Network (SDN) technologies including SDN controllers, network control and management applications, southbound protocols, and northbound interfaces. NFV technologies are reviewed, including network function virtualization infrastructure, virtualized network functions, virtual network management and orchestration. Professionals find comprehensive discussions on the relationship between SDN and NFV and how they may integrate into unified future network architecture. Virtualization network services including, cloud, carrier Ethernet services, and IP VPN services are also covered.

336 pp. • 2016 • eBook ISBN: 978-1-63081-440-3 • \$72 / £72
Print ISBN: 978-1-63081-130-3 • \$97 / £97

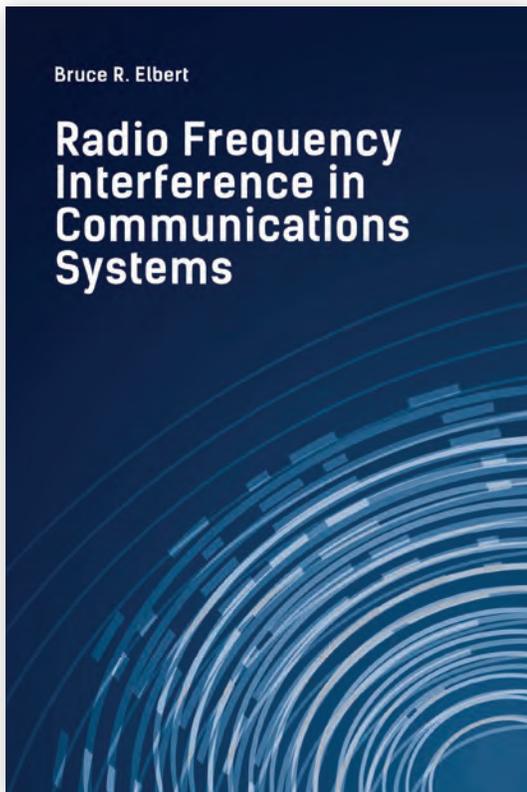


Inside Bluetooth Low Energy, Second Edition

Naresh Kumar Gupta

This updated and expanded second edition of the Artech House bestseller, *Inside Bluetooth Low Energy*, presents the recent developments within the Bluetooth Core Specifications 4.1 and 4.2. This new edition explores both Internet of Things (IoT) and Bluetooth Low Energy (LE) in one single flow and demonstrates how this technology is very well suited for IoT implementations. The book covers all the advances within the new specifications including Bluetooth LE enhanced power efficiency, faster connections, and enhanced privacy and security. Developed for ultra-low power devices, such as heart rate monitors, thermometers, and sensors, Bluetooth LE is one of the latest, most exciting enhancements to Bluetooth technology.

458 pp. • 2016 • eBook ISBN: 978-1-63081-370-3 • \$112 / £97
Print ISBN: 978-1-63081-089-4 • \$149 / £129

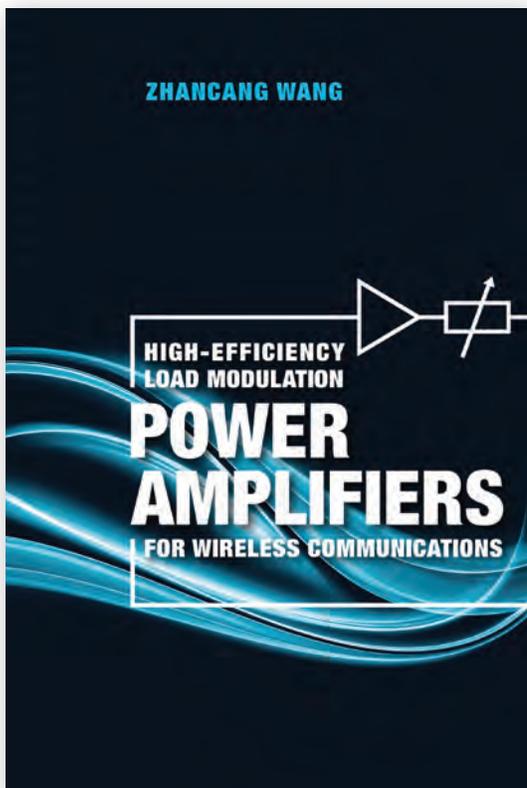


Radio Frequency Interference in Communications Systems

Bruce Elbert

This authoritative resource describes how to assess and mitigate RF interference in radio systems and presents effective methods to identify and resolve RFI before, during and after its appearance. Authored by a leading authority in the field, this book provides engineers and managers with the knowledge they need in the control of Radio Frequency Interference. Readers find practical guidance in an array of critical areas, including engineering of radiocommunication and wireless systems in light of RFI, identifying RFI modes, electromagnetic compatibility and spectrum sharing. This book concludes with prospective for RFI resolution in future radiocommunication systems.

242 pp. • 2016 • eBook ISBN: 978-1-60807-966-7 • \$78 / £68
Print ISBN: 978-1-60807-965-0 • \$104 / £90



High-Efficiency Load Modulation Power Amplifiers for Wireless Communications

Zhancang Wang

This cutting-edge resource presents a complete and systematic overview of the practical design considerations of radio frequency (RF) high efficiency load modulation power amplifiers (PA) for modern wireless communications for 4G and beyond. It provides comprehensive insight into all aspects of load modulation PA design and optimization not only covering design approaches specifically for passive and active load modulation operation but also hybrid with dynamic supply modulation and digital signal processing algorithms required for performance enhancement.

414 pp. • 2016 • eBook ISBN: 978-1-63081-467-0 • \$134 / £81
Print ISBN: 978-1-60807-987-2 • \$125 / £108

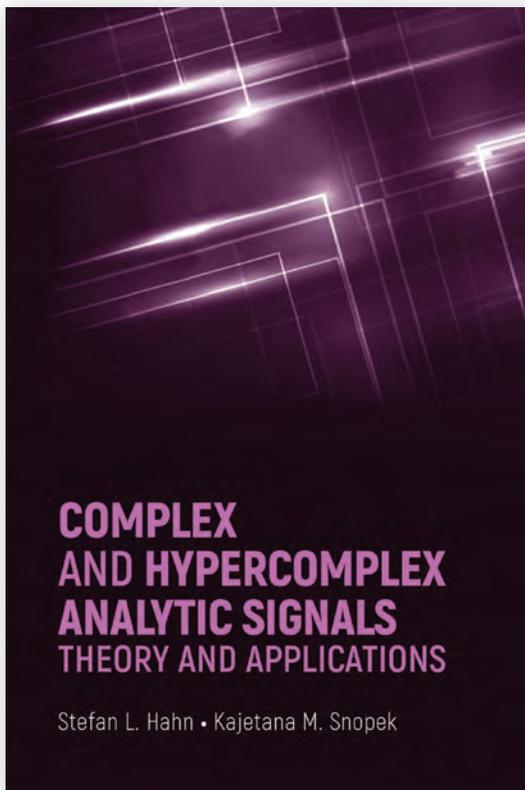


The Technical Foundations of IoT

Boris Adryan, Dominik Obermaier,
and Paul Fremantle

This comprehensive new resource presents a technical introduction to the components, architecture, software, and protocols of IoT. This book is especially catered to those who are interested in researching, developing, and building IoT. The book covers the physics of electricity and electromagnetism laying the foundation for understanding the components of modern electronics and computing. Readers learn about the fundamental properties of matter along with security and privacy issues related to IoT. This book offers insight into the software components that impinge on IoT solutions, development, network protocols, backend software, data analytics and conceptual interoperability.

480 pp. • 2017 • eBook ISBN: 978-1-63081-466-3 • \$97 / £84
Print ISBN: 978-1-63081-251-5 • \$129 / £112

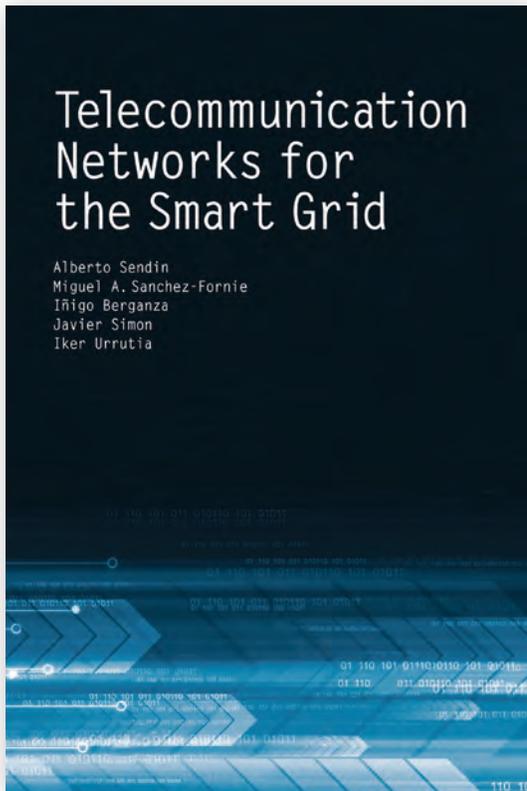


Complex and Hypercomplex Analytic Signals: Theory and Applications

Stefan L. Hahn and Kajetana M. Snopek

Based on the bestselling Artech House classic title, *Hilbert Transforms Signal Processing*, this comprehensive new resource introduces complex and hypercomplex analytic signals and their applications. Professionals find in-depth explanations of the theory of multidimensional complex and hypercomplex signals illustrated with numerous examples and followed by practical applications. The survey of chosen hypercomplex algebras and the orthants of the n-dimensional Cartesian space and single-orthant operators are explored. This book also covers topics including, the polar representation of analytic signals, quasi-analytic signals, the space-frequency of n-D complex and hypercomplex signals as well as the causality of signals.

316 pp. • 2016 • eBook ISBN: 978-1-63081-438-0 • \$89 / £77
Print ISBN: 978-1-63081-132-7 • \$118 / £118

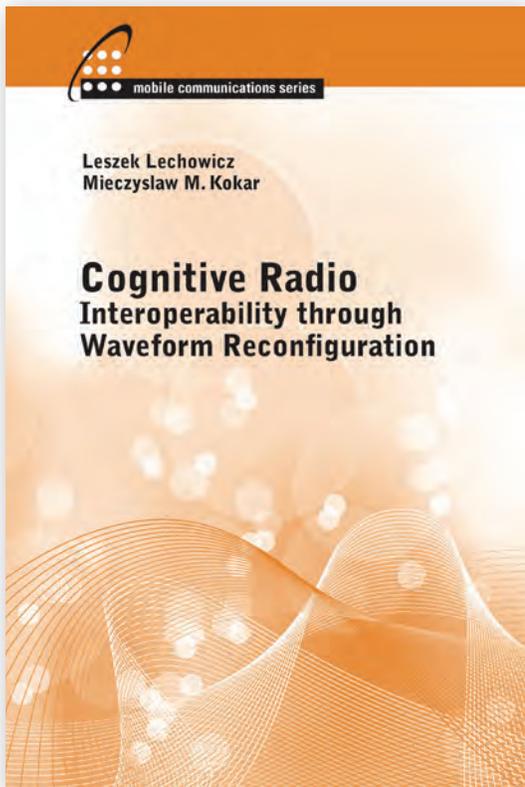


Telecommunication Networks for the Smart Grid

Alberto Sendin, Miguel A. Sanchez-Fornie, Inigo Berganza, Javier Simon, and Iker Urrutia

This comprehensive new resource demonstrates how to build smart grids utilizing the latest telecommunications technologies. Readers find practical coverage of PLC and wireless for smart grid and are given concise excerpts of the different technologies, networks, and services around it. Design and planning guidelines are shown through the combination of electricity grid and telecommunications technologies that support the reliability, performance and security requirements needed in smart grid applications. This book covers a wide range of critical topics, including telecommunications for power engineers, power engineering for telecommunications engineers, utility applications projecting in smart grids, technologies for smart grid networks, and telecommunications architecture.

360 pp. • 2016 • eBook ISBN: 978-1-63081-373-4 • \$127 / £104
Print ISBN: 978-1-63081-046-7 • \$169 / £139

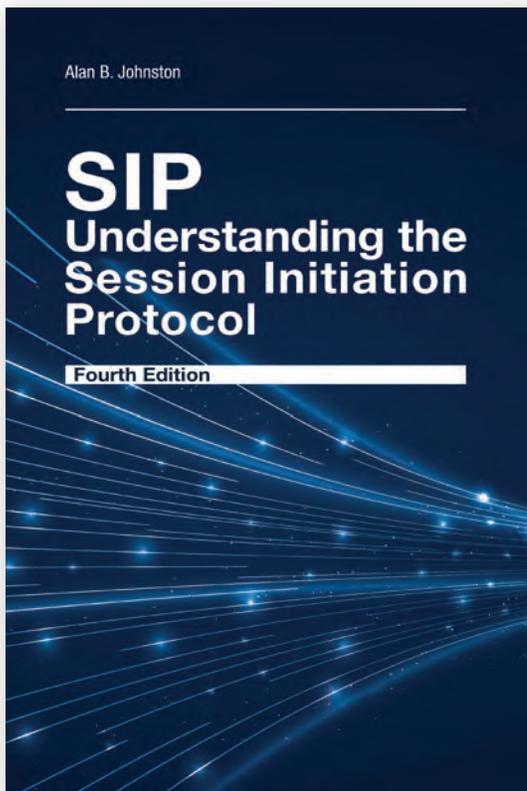


Cognitive Radio: Interoperability Through Waveform Reconfiguration

Leszek Lechowicz and Mieczyslaw M. Kokar

In the span of a century, radio technology advanced from spark transmitters, through analog radios based on vacuum tubes to solid state radios to finally software defined radios where most of the transmit and receive functionalities are implemented as programs running on specialized microprocessors. In recent years, cognitive radio emerged, which combines a software-defined radio with an intelligent agent, and promises to deliver a new level of functionality. This new resource addresses cognitive radio design from the perspective of interoperability with an emphasis on waveform configuration for increased flexibility and enhanced performance.

286 pp. • 2015 • eBook ISBN: 978-1-60807-754-0 • \$81 / £70
Print ISBN: 978-1-60807-753-3 • \$109 / £94

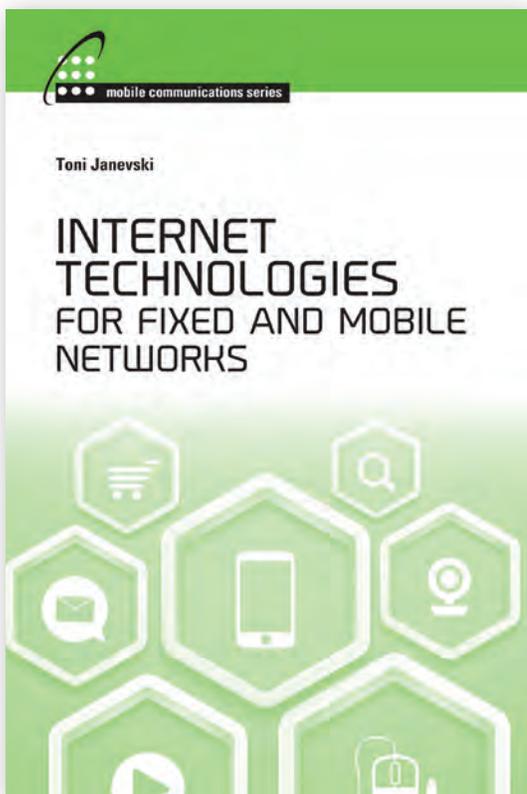


SIP: Understanding the Session Initiation Protocol, Fourth Edition

Errikos Lourandakis

Now in its fourth edition, the ground-breaking Artech House bestseller *SIP: Understanding the Session Initiation Protocol* offers you the most comprehensive and current understanding of this revolutionary protocol for call signaling and IP Telephony. The fourth edition incorporates changes in SIP from the last five years with new chapters on internet threats and attacks, WebRTC and SIP, and substantial updates throughout. This cutting-edge book shows how SIP provides a highly-scalable and cost-effective way to offer new and exciting telecommunication feature sets, helping practitioners design next generation network and develop new applications and software stacks.

530 pp. • 2015 • eBook ISBN: 978-1-60807-864-6 • \$89 / £77
Print ISBN: 978-1-60807-863-9 • \$119 / £103



Internet Technologies for Fixed and Mobile Networks

Toni Janevski

The convergence of legacy telecommunications towards the Internet and Internet technologies is an ongoing process, resulting in converged Telecom and Internet worlds. Based on current and developing industry practice, this book focuses on the Internet technologies, in particular, on Internet principles, protocols, and services for fixed and mobile networks, including technologies, regulation, and business aspects. This timely resource provides readers with all-around coverage of standardized Internet technologies, Internet standardization regarding the Telecom sector, as well as the convergence of all services onto the Internet.

394 pp. • 2015 • eBook ISBN: 978-1-60807-922-3 • \$104 / £89
Print ISBN: 978-1-60807-921-6 • \$139 / £119

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