

Practical Books for Engineering Professionals

A Comprehensive Catalog
and 2022 Summer Preview



Every engineer can become an expert

- Radar
- GNSS / GPS
- Electronic Warfare
- Antennas
- Power Engineering
- Electromagnetics
- RF & Microwave Design
- MEMS / Nanotechnology

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JUST PUBLISHED
Mastering Technical Sales: The Sales Engineer's Handbook, Fourth Edition

John Care

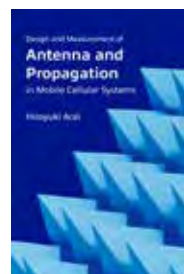
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NOW AVAILABLE
Radar for Fully Autonomous Driving

Matt Markel

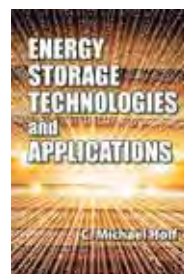
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COMING SOON
Design and Measurement of Antenna and Propagation in Mobile Cellular Systems

Hiroyuki Arai

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COMING SOON
Energy Storage Technologies and Applications

C. Michael Hoff

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COMING MAY 2022 Millimeter-Wave GaN Power Amplifier Design

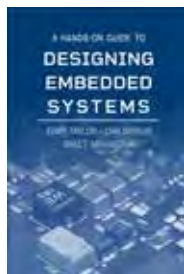
Edmar Camargo

This book gives you – in one comprehensive and practical resource – everything you need to successfully design modern and sophisticated power amplifiers at mmWave frequencies. The book provides an in-depth treatment of the design methodology for MMIC power amplifiers, then brings you step by step through the various phases of design, from

the selection of technology and preliminary architecture considerations, to the effective design of the matching circuits and conversion of electrical-to-electromagnetic models. Detailed figures and numerous practical applications are included to help you gain valuable insights into these technologies and learn to identify the best path to a successful design. You'll be guided through a range of new mmWave power applications that show particular promise to support new 5G systems, while mastering the use of GaN technology that continues to dominate the power mmWave applications due to its high power, gain, and efficiency. This is a valuable resource for power amplifier design engineers, technicians, industry R&D staff, and anyone getting into the area of power MMICs who wants to learn how to design at mmWave frequencies.

Contents: Models for GaN Technology; FET Based Amplifiers; Impedance Matching; High Power Amplifiers; State of The Art Amplifiers.

Hardcover • 340 pp. • 2022 • ISBN: 978-1-63081-944-6 • [\\$189](#)



A Hands-On Guide to Designing Embedded Systems

Adam Taylor, Dan Binnun, Saket Srivastava

This practical resource introduces readers to the design of field programmable gate array systems (FPGAs). Techniques and principles that can be applied by the engineer to understand challenges before starting a project are presented. The book provides a framework from which to work and approach development of embedded systems that will give readers a better understanding of the issues

at hand and the ability to develop solutions that present lower technical and programmatic risk and a faster time to market.

Contents: Design Life Cycles; Requirement Capture; Architectural Design (Tradeoffs); Engineering Budgets; ICDs; Verification; Engineering Governance; Hardware Architecture; Test Plans; Designing the System; Component Selection; De-Rating; Connectorization; Decoupling; Design Integrity; PCB Layout Considerations; Bringing the Design Up; FPGA Development Overview; Good Design Practice; State Machines; Safer State Machines; How FPGAs do Maths;CORDIC Algorithm; Test Benches; Digital Filters within FPGAs; Interfacing ADC and DAC; What is Reliability; What does MTBF Mean?; Finding Your Place on the Bathtub Curve; Redundancy; Failure Mode; Worst Case Analysis; Reliability Figure Calculations.

Hardcover • 286 pp. • 2021 • ISBN: 978-1-63081-683-4 • [\\$168](#)



Bogatin's Practical Guide to Prototype Breadboard and PCB Design

Eric Bogatin

This multimedia ebook is the foundation building book for all engineers starting out to design PCBs. It teaches good habits for designing a PCB, first for connectivity, and secondly, introduces the four most important principles to reduce noise. A seven-step process is presented: developing a plan of record, creating a Bill of Materials, completing the schematic,

completing the layout, completing the assembly, conducting bring up and troubleshooting and documenting the project. Each step is developed in detail. In particular, the emphasis in this book is on risk management: what can be done at each step of the process to reduce the risk of a hard-error which requires a complete re-spin, or a soft error, which requires some sort of on-the-fly repair.

Contents: A Getting Started Guide; PCB Technology; Signal Integrity and Interconnects; Electrical Properties of Interconnects; Trace Width Considerations: Max Current; Trace Width Considerations: Series Resistance; The Seven Steps in Creating a PCB; Step 1- POR: Risk mitigation; Risk Reduction: Datasheets, Reverse Engineering and Component Selection; Risk Reduction: Virtual and Real Prototypes; Risk Reduction: Prototyping with a Solderless Breadboard; Switching Noise and Return Path Routing; Power Delivery; Design for Performance: The PDN on a PCB; Risk Reduction: Design for Bring up; Risk Reduction: Design Reviews; Step 2: Surface Mount or Through Hole Parts; Finding the 1 part in a million; Step 3: Schematic Capture and Final BOM; Step 4: Layout- Setting up the Board; Floor Planning and Routing Priority; Six Common Misconceptions About Routing; Four-layer Boards; Release the Board to the Fab Shop; Step 6- Bring Up; Step 7: documentation; Concluding Comments; About Eric Bogatin.

eBook • 536 pp. • 2021 • ISBN: 978-1-63081-848-7 • [\\$119](#)



NONLINEAR DESIGN: FETS AND HEMTS

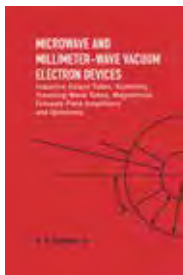
Peter H. Ladbrooke

This exciting new resource describes a unified approach to non-linear analysis and design involving compound semiconductor field effect transistors (FETs) and heterojunction field effect transistors (HFETs). It provides an understanding of the characterization and analysis devices made by non-linear design, highlighting the relationship between design and performance. The rarely

acknowledged errors inherent in extracting capacitive and conductance elements, as required by all circuit models, from measurements made at the terminals of a device are given, and how these limitations and restrictions often yield workable results is demonstrated.

Contents: Introduction; Summary of approaches and needs; Practical behavior of FETs; The standard model: deriving the elements; The capacitance puzzle in the standard model; Dynamic I(V) measurements

Hardcover • 400 pp. • 2021 • ISBN: 978-1-63081-868-5 • [\\$189](#)



Microwave and mm-Wave Vacuum Electron Devices: Inductive Output Tubes, Klystrons, Traveling Wave Tubes, Magnetrons, Crossed-Field Amplifiers, and Gyrotrons

A.S. Gilmour, Jr.

Written by an internationally recognized expert on the subject of microwave tubes, this book presents and describes the many types of MW tubes, despite

competition from solid-state devices (those using GaN, SiC, etc), which continue to be used widely and find new applications in defense, communications, medical, industrial drying, and more.

Contents: Introduction; Capabilities of Micro and mm wave tubes; Characteristics of Micro and mm waves; The Vacuum Level; Cathodes; Electron Guns; Electron Beams; Beam Modulation; Current Induction and Circuit Response; Klystrons; High Performance Klystrons; Klystrones and Other Gridded Tubes; Helix TWTs; Coupled-Cavity TWTs; Collectors; Nonlinearities, Distortion and Noise; Noise; Magnetrons; Crossed-Field Amplifiers; Gyrotrons; Windows; Appendixes.

Hardcover • 880 pp. • 2020 • ISBN: 978-1-63081-728-2 • [\\$179](#)



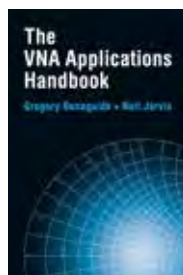
RF Circuits and Applications for Practicing Engineers

Mouqun Dong

Intended for practicing engineers and circuit designers, this book focuses on practical topics in circuit design and measurement techniques. It bridges the gap between textbook materials and real circuit designs using real circuit examples and practical tips.

Contents: S Parameters; The Smith Chart and Impedance Matching Networks; Circuit Designs Using S Parameters; Noise and Its Characterization in RF Circuit Applications; Low Noise RF Amplifier Design and Constant-Circle Method; High Power RF Amplifiers; High Efficiency RF Power Amplifiers; RF Characterization of Wireless Communication Systems; RF Measurements; Passive Components; RF Switches.

Hardcover • 380 pp. • 2020 • ISBN: 978-1-60807-631-5 • [\\$169](#)



The VNA Applications Handbook

Gregory Bonaguidi and Neil Jarvis

Written by prominent experts in the field, this authoritative new resource provides guidelines for a wide variety of Vector Network Analyzers (VNA). 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.

Contents: Architecture of the Modern VNA; Calibration Techniques; Cable, Adapter and Attenuator Measurements; Filter, Transformer, Coupler, Circulator Measurements; Amplifier Measurements; Measurements on Mixers and Frequency Converters; Pulse Measurements; Antenna Measurements; Waveguide and Millimeter-Wave Measurements; Measurements on a Probe Station.

Hardcover • 388 pp. • 2019 • ISBN: 978-1-63081-600-1 • [\\$169](#)



PCB Design Guide to Via and Trace Currents and Temperatures

Douglas Brooks, Johannes Adam

A very important part of printed circuit board (PCB) design involves sizing traces and vias to carry the required current. This exciting new book will explore how hot traces and vias will be and what board, circuit, design, and environmental parameters are the most important. PCB materials (copper and dielectrics) and the role they play in the heating and cooling of traces are covered.

Contents: Introduction and Historical Background; Materials Used in PCB; Resistivity and Resistance; Trace Heating and Cooling; IPC Curves; Thermal Simulation Model +; Thermal Simulations; Via Temperatures; Current Densities in Vias; Thinking Outside the Box; Fusing Currents; Background; Fusing Currents; Analyses; Do Traces Heat Uniformly; Relevance of Current Density; AC Currents; Industrial CT Scanning; Appendixes.

Hardcover • 246 pp. • 2019 • ISBN: 978-1-63081-860-9 • [\\$159](#)



Bogatin's Practical Guide to Transmission Line Design and Characterization for Signal Integrity Applications

Eric Bogatin

This multimedia eBook establishes a solid foundation in the essential principles of how signals interact with transmission lines, how the physical design of interconnects affects transmission line properties, and how to interpret single-ended and differential time domain reflection (TDR)

measurements to extract important figures of merits and avoid common mistakes. This book presents an intuitive understanding of transmission lines. Never be intimidated by impedance or differential pairs again.

Contents: What are transmission lines and why should we care; Single-ended lossless and differential lossy transmission lines; Calculating characteristic impedance; Reflections when the instantaneous impedance changes; The TDR; Practical TDR Measurements; Exploring geometry and impedance: 1st order effects; Second order factors; Dielectric Materials and Dk; Practical design issues; The capacitance and inductance in a transmission line; Input impedance of a transmission line; Simple point to point transmission line circuits; What every scope user needs to know about transmission lines; Terminating transmission line circuits; Appendixes.

Hardcover • 603 pp. • 2020 • ISBN: 978-1-63081-851-7 • [\\$99](#)

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Günter Kompf
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Matthew Morgan
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Terry Edwards
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JC Olivier
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JC Olivier
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Kazuhiro Mochizuki
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Howard Hausman
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Matteo Pastorino and Andrea Randazzo
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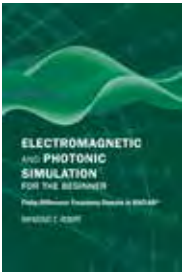
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JUST PUBLISHED
Electromagnetic and Photonic Simulation for the Beginner: Finite-Difference Frequency-Domain in MATLAB®

Raymond C. Rumpf

This book teaches you everything you need to know to simulate a wide variety of electromagnetic and photonic devices using the powerful finite-difference frequency-domain (FDFD) method.

The book comprehensively reviews key concepts from electromagnetics and is packed with MATLAB® codes and special techniques that demonstrate how FDFD can be applied to a very wide array of devices and applications. All of the equations needed for FDFD are derived, explained, and implemented in many different MATLAB codes to simulate different devices. A great resource for those new to this field.

Contents: MATLAB Preliminaries; Electromagnetic Preliminaries; The Finite-Difference Method; Finite-Difference Approximation of Maxwell's Equations; The Perfectly Matched Layer Absorbing Boundary; FDFD for Calculating Guided Modes; FDFD for Calculating Photonic Bands; FDFD for Scattering Analysis; Parameter Sweeps with FDFD; FDFD Analysis of Three-Dimensional and Anisotropic Devices; Appendixes.

Hardcover • 350 pp. • 2022 • ISBN: 978-1-63081-926-2 • [\\$189](#)



Machine Learning Applications in Electromagnetics and Antenna Array Processing

Manel Martínez-Ramón, Arjun Gupta, José Luis Rojo-Álvarez, Christos Christodoulou

This practical resource provides an overview of machine learning (ML) approaches as applied to electromagnetics and antenna array processing. Detailed coverage of the main trends in ML, including uniform and random array processing (beamforming and detection of angle of arrival),

antenna optimization, wave propagation, remote sensing, radar, and other aspects of electromagnetic design are explored. An introduction to machine learning principles and the most common machine learning architectures and algorithms used today in electromagnetics and other applications is presented, including basic neural networks, gaussian processes, support vector machines, kernel methods, deep learning, convolutional neural networks, and generative adversarial networks. Applications in electromagnetics and antenna array processing that are solved using machine learning are discussed, including antennas, remote sensing, and target classification.

Contents: Part I: Introduction to Machine Learning: Kernel methods for array processing; Support Vector Machines; Gaussian Processes for signal processing; Neural Networks; Convolutional neural networks; Recursive neural networks for signals; Restricted Boltzmann Machines; Generative Adversarial Networks; Part II: Applications in Electromagnetics and Antenna Array Signal Processing: Antenna Array Signal Processing; Radar and Remote Sensing; Computational Electromagnetics; Reconfigurable Antennas and Cognitive Radio; Design and Optimization of Antennas and RF devices; Wave Propagation and Modelling; Electromagnetics for Medicine and Healthcare.

Hardcover • 340 pp. • 2021 • ISBN: : 978-1-63081-775-6 • [\\$189](#)



Electromagnetic Diffraction Modeling and Simulation with MATLAB®

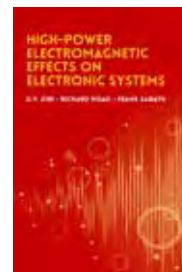
Gökhan Apaydin, Levent Sevgi

This exciting new resource presents a comprehensive introduction to the fundamentals of diffraction of two-dimensional canonical structures, including wedge, strip, and triangular cylinder with different boundary conditions. Maxwell equations are discussed, along with wave equation and scattered, diffracted and fringe fields. Geometric optics, as

well as the geometric theory of diffraction are explained. With MATLAB scripts included for several well-known electromagnetic diffraction problems, this book discusses diffraction fundamentals of two-dimensional structures with different boundary conditions and analytical numerical methods that are used to show diffraction.

Contents: Introduction; Two-Dimensional Canonical Wedge Problem; Two-Dimensional Canonical Strip Problem; Two-Dimensional Canonical Triangular Cylinder Problem; Diffraction at a Rectangular Plate; Diffraction with Rounded Edges; Double Tip Diffraction Modeling; WedgeGUI Virtual Package; FringeGUI Virtual Package; WedgeTOOL Virtual Package.

Hardcover • 246 pp. • 2021 • ISBN: : 978-1-63081-779-4 • [\\$149](#)



High-Power Electromagnetic Effects on Electronic Systems

D.V. Giri, Frank Sabath, and Richard Hoad

This is the first book that comprehensively addresses the issues relating to the effects of radio frequency (RF) signals and the environment of electrical and electronic systems. It covers testing methods as well as methods to analyze radio frequency. The generation of high-powered electromagnetic (HPEM) environments, including moderate band damped sinusoidal radiators and hyperband

radiating systems is explored. HPEM effects on component, circuit, sub-system electronics, as well as system level drawing are discussed. The effects of HPEM on experimental techniques and the standards which can be used to control tests are described. The validity of analytical techniques and computational modeling in a HPEM effects context is also discussed.

Readers will learn to consider the importance of HPEM phenomena as a threat to modern electronic based technologies which underpin society and to therefore be pre-emptive in the consideration of HPEM resilience.

Contents: Introduction; Brief Review of RF Environments of Interest; Examples of RF Effects on Civilian and Military Systems; RF Effects on Electronics; System Level; Subsystem and Component Level Consequences of RF Effects on Electronic Systems; Characterization of RF Effects; RF Effects Mechanisms and Their Relation to Incident RF parameters; RF Effects Testing Methodologies; Methods to analyze RF Effects; Methods to detect RF Environments and EF Effects; Protection concepts and methods.

Hardcover • 334 pp. • 2020 • ISBN: 978-1-63081-588-2 • [\\$169](#)

Wired and Wireless Seamless Access Systems for Public Infrastructure

Tetsuya Kawanishi

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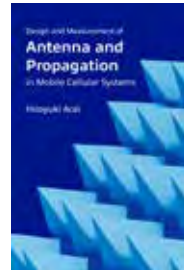
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Hiroyuki Arai

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mentals of and design considerations for both antennas and propagation, which is not commonly found together in one resource. The book helps you understand the practical design procedures of mobile communication antenna systems based on the propagation estimation by measurements and simulation. You will learn all the required knowledge and background for the research and development of current and future systems, and a host of other essential considerations and conditions pertaining to antenna and propagation.

Contents: Basic Theory of Antennas, Basic theory of EM Wave Propagation, Fundamentals of Antennas and Propagation Measurement, Antenna Element and Array, Design of Base Station Antennas, Design of Mobile Terminal Antennas, Measurement of Base Station and Mobile Terminal Antennas, Propagation Estimation and Emulation of Fading, Antenna and Channel Capacity, Propagation Measurements, and Antenna and Propagation Challenges in Future Mobile Communication Systems.

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This book provides practical and theoretical aspects for automotive antenna measurements. It comprehensively covers all the information you need to design, develop, place, and use antennas and antenna systems in automotive applications. Special chapters are devoted to some of the most advanced topics in this area, including OTA measurements for

Vehicle to Everything (V2X) applications, emulation of virtual drive testing, and specific topics for measurements of automotive RADAR systems. You will understand the various measurement techniques specifically for automotive antennas, including chamber design, absorbers, near-to-far field transformation, and some of the newest techniques such as the use of drones. The book presents both well accepted and standard practices and includes innovative methods that help you quickly adapt to the rapidly evolving field of automotive antenna testing today. This is an excellent reference for antenna engineers, automotive system designers, and anyone who measures and designs antennas for automotive applications.

Contents: Introduction to automotive antenna measurements. Near-Field vs far-field technique. Near field vs farfield. Chamber design & analysis. Single probe systems for automotive measurements. Multi-probe system for automotive measurements. In-situ acquisition systems for automotive measurements: drone and handheld approaches. Post-processing techniques in near field systems. V2X automotive measurements. Virtual drive testing. Future trends in automotive measurements.

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JUST PUBLISHED Sparse Phased Array Antennas: Theory and Applications

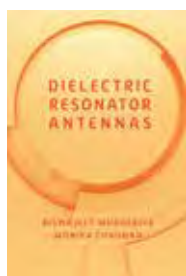
Ashutosh Kedar

Here's a ground-breaking resource that gives you the background theories and know-how you need to effectively design active phased array antennas with wider bandwidth and scan volume utilizing sparse array technology. The book shows you how to incorporate aperiodic arrays and sparse arrays as a solution for overcoming the restrictions faced in

conventional phased antenna designs – such as blind spots, limited scan volume, large power and cooling requirements, RF path losses, and increased complexity – while adhering to the maintenance of SWAP-C resources widely used in aerospace and defence.

Contents: The Beginning. Antenna Fundamentals. Antenna Arrays. Generalized expression for directivity. Synthesis of Linear Sparse Antenna Arrays. Concentric ring antenna sparse array antennas. Planar sparse array antennas. Use cases for sparse array antennas.

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NEW RELEASE Dielectric Resonator Antennas

Biswajeet Mukherjee and Monika Chauhan

This comprehensive resource explores Dielectric Resonator Antennas (DRAs) and its applications in antenna systems, including bandwidth enhancement, gain improvement, and MIMO applications. The concepts of low-profile and compact DRA techniques are explained, as well as the step-by-step design process and various pitfalls in designing DRAs. Readers will understand the resonant modes

of DRA geometries and find detailed analysis of how they are generated. The fabrication techniques available in measurement methods, as well as constraints in choosing the correct dielectric material for a particular application are discussed.

Contents: Foreword to Dielectric Resonator Antennas; Dielectric Resonator Antenna (DRA) Bandwidth enhancement techniques; Dielectric Resonator Antenna (DRA) Circular Polarization Techniques; Dielectric resonator antenna Gain enhancement techniques; Dielectric Resonator Antenna MIMO and diversity application; Fabrication, Experimental Set up, Measurement and Practical Considerations.

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NEW RELEASE Antenna Design for CubeSats

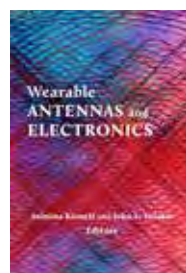
Reyhan Baktur

This book delivers systematic guidance on designing antennas specially made for CubeSat applications. It takes you step-by-step through the entire antenna design process, from understanding the CubeSat standards and architectures that affect your design, to creating antennas customized to the specific CubeSat mission. This is a must-have reference for antenna engineers and anyone interested in satellite

technology and novel antenna design.

Contents: Orbits and Small Satellites; CubeSats- From Concept to Orbit; Overview of CubeSat Antennas: Design Considerations, Categories, and Link Budget Development; Traditional CubeSat Antennas; Conformal Integration of Antennas with CubeSat Solar Panels; High Gain Antennas for CubeSats and Emerging Solutions

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JUST PUBLISHED Wearable Antennas and Electronics

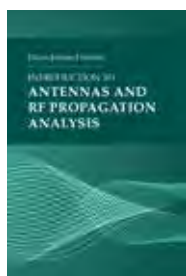
Asimina Kiourt and John L. Volakis

Here is a practical and comprehensive guide to game-changing and state-of-the-art wearable antennas and RF electronics and their applications. The book details how to weave clothing into functional antennas and sensors to serve as unobtrusive devices for medical monitoring, athletic performance tracking, body-area network commu-

nications, and a host of other applications. Great book for anyone working in the growing industry of wearables and body-area devices.

Contents: Introduction; Basic Approaches for Printing and Weaving Wearables; Wearable Electronics with Flexible, Transferable, and Remountable Components; Wearable Antennas; Wearable Sensors; Wearable RF Harvesting; Radiofrequency Finger Augmentation Devices for Tactile Internet; Wearable Imaging Technologies; Wearable Wireless Power Transfer Systems, and Emerging Solutions

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Introduction to Antennas and RF Propagation Analysis

Dean James Friesen

This practical text gives engineers and technicians at all levels an easy-to-follow entry point into the subject of RF/EM wave propagation and antennas. The book covers the essentials, practices, technical details, and considerations needed to help a team of engineers design, install, and/or predict the technical performance of a new (or even existing) one-way, two-antenna (long radiating distance) RF

communication system. This is a great learning tool, as well as an excellent supplement or foundational text for an instructional course. The book's logically organized and easy-to-access chapter structure also facilitates its use as a bench reference for quick lookup or review.

Contents: Section I – RF/EM Wave Propagation Fundamentals: Introduction; Characteristics of Electromagnetic Waves; One-Way RF Propagation: The Friis Equation and Free Space Loss; Section II: Additional RF Signal Losses and Causes; Multipath Loss; Fresnel Zone Loss; Antenna Feedline Losses and Antenna Polarization Loss; Other Radiated RF Losses to Consider; Section III – Antennas: Antenna Groupings and Antenna Parameters; Isotropic (Point Source) Antenna; Wire Antennas; Aperture Antennas; Slot Antennas; Horn Antennas; Array Antennas; Reflector Antennas; Yagi-Uda Antennas; Broadband Antennas; Noise and SNR; Receiver Noise, Received Noise, and Signal-to-Noise Ratio; Conclusion.

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Hammad M. Cheema, Fatima Khalid, Atif Shamim

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Yefim Poberezhskiy and Gennady Poberezhskiy

This comprehensive resource provides the latest information on digitization and reconstruction (D&R) of analog signals in digital radios. You 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.

Contents: Signals and Waveforms; Radio Systems; Signal Processing in Communication Systems; Digital Photo Transmitters; Digital Radio Receivers; Sampling Theory Fundamentals; Conventional D&R in Digital Receivers; Alternative Digitization Techniques; Conventional D&R in Digital Receivers; Digital-to-Analog Converters (D/As); Analog-to-Digital Conversion (A/D) in Digital Radios; Methods of Increasing Speed and Resolution of A/Ds; Novel Digitization Circuits (NCDs) in Digital Receivers; Novel Reconstruction Circuits (NRCs) in Digital Transmitters; Selection of Weight Functions for NDCs and NRCs.

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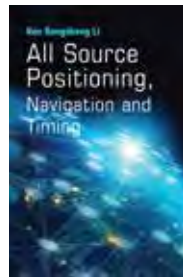
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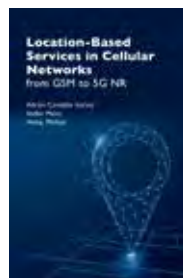
All Source Positioning, Navigation and Timing

Rongsheng (Ken) Li

This is the first book on the topic of all source positioning, navigation and timing (PNT) which is a topic of research and development funded by both government and the private industry worldwide. This book explores when the most convenient PNT measurement source available today, the GPS system, may become unavailable, jammed or spoofed.

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Location-Based Services in Cellular Networks: From GSM to 5G NR

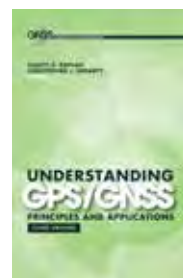
Adrián Cardalda García, Stefan Maier, and Abhay Phillips

The comprehensive guide to positioning technologies in the cellular networks includes an explanation of the positioning fundamentals and a summary of the use cases. The book also focuses on the different positioning technologies used in cellular networks, divided in satellite positioning, terrestrial radio positioning,

non-RF positioning and a brief introduction to sensor fusion and Bayesian theory. Explanation of different signaling parameters will enable the reader to understand better how positioning works in a cellular network.

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Understanding GPS/GNSS Principles and Applications, Third Edition

Elliott Kaplan and Christopher J. Hegarty

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BeiDou GPS systems, GLONASS, and explores advanced receiver autonomous integrity monitoring (ARAIM). The book covers all the latest advances in technology, applications, and systems.

Contents: Fundamentals of Satellite Navigation; Global Positioning System; GLONASS; Galileo; BeiDou; Regional Systems; GNSS Receivers; GNSS Disruptions; GNSS Errors; Performance of Stand-Alone GNSS; Differential GNSS and Precise Point Positioning; Integration of GNSS with other Sensors and Network Assistance; GNSS Markets and Applications.

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Hector Fenech

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Geoff Varrall

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Geoff Varrall

This 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.

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The Cost of Co-Existence; Allocation and Auction Economics-Theory and Practice; Middle Earth; 3 Band 5G-Wavelength Bands; The Metre Band; The 3 Band Model-The Centimeter Band-3 GHz to GHz; The Millimeter Band; 5G DSP; 5G The End of the Story?

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Matt Markel

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Contents: Modern Radar Sensors in Advanced Automotive Architectures; Design Considerations for Automotive Radar; DCM - Digital Code Modulation – Radar; Automotive MIMO Radar; Synthetic Aperture Radar for Automotive Applications; Radar Transceiver Technologies; Radar Challenges from the Automotive Scene; Radar Interference; The Impacts of Water (Weather) on Automotive Radar; Safety Considerations for Radars in Fully Autonomous Vehicles; and Testing Automotive Radars.

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Hugh D. Griffiths, Christopher J. Baker

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The book gives you the knowledge you need to get a full understanding of this fascinating technology. All chapters have been fully revised and updated and are written in a clear and accessible style. New chapters have been added to cover advances in the technology that have already been built and demonstrated, including systems on moving platforms (aircraft and UAVs), as well as advances in types of transmission – notably single-frequency broadcast transmissions, and 5G – and in processing techniques. This book remains an important resource for engineers working in academic, industry, or government research laboratories; academics teaching graduate level students; and those working in the specification and procurement of radar systems who need to understand the performance and limitations of the technology.

Contents: Introduction; Principles of Passive Radar; Properties of Illuminators; Passive Radar and Single Frequency Networks; Direct Signal Suppression; Passive Radar Performance Prediction; Detection and Tracking; Passive Radar from Moving Platforms; Examples of Systems and Results; and Future Developments and Applications.

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COMING SOON Motion and Gesture Sensing with Radar

Jian Wang and Jaime Lien

This book provides a complete overview of radar system theory and design for consumer applications, from basic short range radar theory to the integration into the real-world products, focusing particularly on gesture sensing in consumer products. Packed with practical guidance learned from real consumer product development, the book explains

how radar works in plain language; provides design principles applied in consumer products; demonstrates algorithms with real world measurement data; describes system trade-offs and cross-functional solutions for solving integration challenges; equips you to design your own radars in consumer electronics for motion sensing and gesture controls. With its unique coverage of consumer-oriented radar systems, coupled with the authors’ practical experience in designing radars for today’s consumer products, this is a must-have book for engineers and researchers working with radar systems in consumer electronics and mobile devices such as cell phone, wearables, and in the automotive industry. Downloadable MATLAB® scripts and Simulink models are included.

Contents: Radar System Architecture and Range Equation. Radar Signal Model and Demodulation. Radar Signal Processing. Array Signal Processing. Detection Theory. Radar Machine Learning. Understanding Radar for Human-computer Interaction. Future Research and Applications

Hardcover. 288 pp. Sept. 2022. ISBN 978-1-163081-823-4 \$145



JUST PUBLISHED RADAR RF CIRCUIT DESIGN, Second Edition

Nickolas Kingsley and Joseph R. Guerci

Completely updated with new material, this new edition delivers practical techniques for optimizing RF and microwave circuits for applications in radar systems design, with an emphasis on current and emerging technologies. The book shows you how to design RF components for radar systems and

how to choose appropriate materials and packaging methods. It takes you through classic techniques, to the state of the art, and finally to emerging technologies. The book serves as a teaching aid for time-tested techniques that are still relevant today. It also demonstrates how these techniques are serving as the foundation for technologies to come. You will be equipped to consider future needs and emerging enabling technologies and confidently think (and design) outside the box to ensure future needs are met. This is a must-have resource for system-level radar designers who want to up their game in RF/microwave component design. It is also a great tool for RF/microwave engineers tasked or interested in designing components for radar systems.

Contents: PART I. Microwave Background: Crossing the Chasm from System to Component Level. Introduction to Microwave Design. Component Modeling. PART II. Component Design: Power Amplifier. Low Noise Amplifiers. Passive Circuitry. PART III. Higher-level Integration: Microwave Integrated Circuits. Transmit/Receive Module Integration. PART IV. Demonstration Hardware: Assembly and Prototyping. On the Measurement Bench. PART V. Advanced Topics: Exploring Terahertz Radar. Final Thoughts. Appendix. Index.

Hardcover • 340 pp. • 2022 • ISBN: 978-1-63081-898-2 • \$169



JUST PUBLISHED
Principles of Modern Radar Missile Seekers

Evgeny Markin

This book gives you an in-depth look into the critical function of interference shielding for onboard radar of anti-aircraft missile systems. Three problematic interferences are presented and discussed in detail: polarization interference; interference to the sidelobe of onboard antenna; and interference from two points in space, including interference reflected from

the earth (water) surface. You will learn the basic principles of radiolocation, including monopulse radars, and get insight into the fundamental functional units of anti-aircraft missiles and surface-to-air missile systems. The book presents guidance methods, systems of direction finding, problems on firing over the horizon, and questions of accuracy and resolution – all important for better addressing solutions of interference shielding.

Contents: Introduction; Tactical and technical characteristics of anti-aircraft missile system; Firing over the horizon; Radio control of atmospheric anti-aircraft missile; Command radio control systems; Homing systems; Radar; Monopulse radars; Some interferences for monopulse radar; Interference immunity of monopulse radar; Modeling; Interference detection problem; Synthesis of solution to improve interference immunity against impact of polarization interference; Synthesis of solution to improve interference immunity against impact of sidelobe interference; Synthesis of solution to improve interference immunity against interference from two points in space

Hardcover • 350 pp. • 2022 • ISBN: 978-1-63081-777-0 • [\\$179](#)



RECENT RELEASE
Introduction to LabVIEW™ FPGA for RF, Radar, and Electronic Warfare Applications

Terry Stratoudakis

Real-time testing and simulation of open- and closed-loop radio frequency (RF) systems for signal generation, signal analysis and digital signal processing require deterministic, low-latency, high-throughput capabilities afforded by user reconfigurable field programmable gate arrays

(FPGAs). This comprehensive book introduces LabVIEW FPGA, provides best practices for multi-FPGA solutions, and guidance for developing high-throughput, low-latency FPGA based RF systems. Written by a recognized expert with a wealth of real-world experience in the field, this is the first book written on the subject of FPGAs for radar and other RF applications.

Contents: How to read this book based on your background; LabVIEW FPGA literature review; Background technology; Using LabVIEW FPGA; Optimizing your LabVIEW FPGA based system; NI LabVIEW FPGA case studies; RF LabVIEW FPGA case studies; Staying Current; Appendix.

Hardcover • 230 pp. • 2021 • ISBN: 978-1-63081-793-0 • [\\$139](#)



Basic Radar Analysis, Second Edition

Mervin C. Budge, Jr. and Shawn R. German

This 2nd edition covers several key radar analysis areas, including the radar range equation, detection theory, ambiguity functions, waveforms, antennas, active arrays, receivers, signal processors, CFAR and chaff analysis. Analog signal processors and digital signal processors of the types used in modern phased array radars are discussed. Fundamentals of radar analysis including the range equation, detection theory,

ambiguity functions, antennas, receivers, and signal processors for modern radars are also covered. This book addresses details of the radar range and detection probability equations and the tools radar engineers commonly use to perform signal processor and clutter analyses.

Contents: Radar Basics; Radar Range Equation; Radar Cross Section; Noise; Radar Losses; Detection Theory; Matched Filter; Detection Probability Improvement Techniques; Ambiguity Function; Waveform Coding; Stretch Processing; Phased Array Antenna Basics; Clutter Model; Signal Model; Pulse Signal Processor; Moving Target Indicator (MTI); Moving Target Detector (MTD); Pulsed Doppler Processors; Chaff Analysis; Radar Receiver Basics; Introduction to Synthetic Aperture Radar Signal Processing; Introduction to Space-Time Adaptive Processing; Sidelobe Cancellation; Appendixes.

Hardcover • 832 pp. • 2020 • ISBN: 978-1-63081-555-4 • [\\$189](#)



Deep Learning Applications of Short-Range Radars

Avik Santra and Souvik Hazra

This exciting new resource covers various emerging applications of short range radars, including people counting and tracking, gesture sensing, human activity recognition, air-drawing, material classification, object classification, vital sensing by extracting features such as range-Doppler Images (RDI), range-cross range images, Doppler Spectrogram or directly feeding raw ADC data to the classifiers.

Spectrogram or directly feeding raw ADC data to the classifiers.

Contents: Introduction to Short Range Radars; Vital Sensing & Occupancy Sensing; Material Classification; Gesture Sensing; Air Writing/Drawing; Human Activity Classification; People Counting and Tracking; Dooring & Street Lighting (Pedestrian/Bike/Car classification); Other Applications.

Hardcover • 350 pp. • 2020 • ISBN: 978-1-63081-746-6 • [\\$179](#)



Signal Processing for Passive Bistatic Radar

Mateusz Malanowski

This cutting-edge resource introduces the basic concepts of passive bistatic radar, such as bistatic geometry, bistatic radar equation and analysis of different illuminating signals. These techniques, although known for almost a century, have not been developed intensively for decades, mainly due to technical limitations, but today, the passive radar concept can be realized in practice, and is of

great interest for military and civilian users. This book provides insight into understanding the potential and limitations of passive radar systems, as well as the differences between signal processing in active and passive radar.

Contents: Introduction; Passive bistatic radar principles; Digital beamforming; Correlation processing; Clutter filtering; Detection and estimation; Bistatic tracking; Target localization; Cartesian tracking; Examples of passive radar systems; Conclusions.

Hardcover • 380 pp. • 2019 • ISBN: 978-1-60807-662-9 • [\\$149](#)



Practical Model-Based Systems Engineering

Jose L. Fernandez and Carlos Hernandez

This comprehensive resource provides systems engineers and practitioners with the analytic, design and modeling tools of the Model-Based Systems Engineering (MBSE) methodology of Integrated Systems Engineering (ISE) and Pipelines of Processes in Object Oriented Architectures (PPOOA) methodology. This methodology integrates model based systems and software engineering approaches for the development of complex products, including aerospace, robotics and energy domains applications.

engineering approaches for the development of complex products, including aerospace, robotics and energy domains applications.

Contents: Introduction; Systems Engineering; Model-Based Systems Engineering; The ISE & PPOOA process; Functional Architecture; Heuristics to apply in the engineering of systems; Physical Architecture; Example of Application: Unmanned Aerial Vehicle- Electric Subsystem; Example of Application: Collaborative robot; Example of Application: Energy Efficiency for the Steam Generation Process of a Coal Power Plant; To Conclude; Appendix A: SysML Notation; Appendix B: Requirements Framework.

Hardcover • 250 pp. • 2019 • ISBN: 978-1-60807-579-0 • [\\$139](#)



FMCW Radar Design

M. Jankiraman

Frequency Modulated Continuous Wave (FMCW) radars are a fast expanding area in radar technology due to their stealth features, extremely high resolutions, and relatively clutter free displays. This groundbreaking resource offers you expert guidance in designing narrowband FMCW radars for surveillance, navigation, and missile seeking. It also provides professionals with a thorough understanding of underpinnings of this burgeoning technology.

Moreover, you find detailed coverage of the RF components that form the basis of radar construction. Featuring clear examples, the book presents critical discussions on key applications.

Contents: The Advent of FMCW Radars; FMCW Waveform; The Radar Ambiguity Function; Noise in Radar Receivers; Radar Detection; Radar System Components; Radar Transmitter/Receiver Architectures; Doppler Processing; Design and Development of FMCW Battlefield Surveillance Radar; Design and Development of FMCW Marine Navigation Radar; Anti-Ship Missile Seeker.

Hardcover • 430 pp. • 2018 • ISBN: 978-1-63081-567-7 • [\\$179](#)



Basic Radar Tracking

Mervin C. Budge, Jr. and Shawn R. German

Detailed closed-loop bandwidth and transient response approach is a subject rarely found in current literature. This innovative resource offers practical explanations of closed-loop radar tracking techniques in range, Doppler and angle tracking. To address analog closed-loop trackers, a review of basic control theory and modeling is included. The book contains solutions to practical problems, making it useful for both novice and advanced radar practitioners. Software will be available for download.

software will be available for download.

Contents: Tracking Basics; Control Theory Review; Track Filters; Closed Loop Range Tracking; Closed Loop Angle Tracking; Closed Loop Doppler Tracking; Simulation Examples; Acquisition and Track Initiation.

Hardcover • 360 pp. • 2018 • ISBN: 978-1-63081-335-2 • [\\$149](#)



Systems Engineering of Phased Arrays

Rick Sturdivant, Clifton Quan, and Enson Chang

Phased arrays, while traditionally used in radar systems, are now being used or proposed for use in internet of things (IoT) networks, high-speed back haul communication, terabit-per-second satellite systems, 5G mobile networks, and mobile phones.

This book considers systems engineering of phased arrays and addresses not only radar, but also these modern applications. It presents a system-level perspective and approach that is essential for the successful development of modern phased arrays.

Contents: The Systems Engineering Process and Its Application to Phased Arrays; Phased Array System Architectures; Use Cases for Phased Arrays; Phased Array Concept Development Example; Antenna Element Technology Options; T/R Modules; Thermal Design, Heat Transfer Trade Studies and Reliability; Analog Versus Digital Beamforming; Digital Receiver Enhancement to Analog Beam Formers; Phased Array System Modeling; Advanced Development Activities for Phased Arrays; Conclusions.

Hardcover • 300 pp. • 2018 • ISBN: 978-1-63081-488-5 • [\\$169](#)



Non-Line-of-Sight Radar

Brian Watson and Joseph Guerci

Non-Line-of-Sight Radar is the first book on the new and exciting area of detecting and tracking targets via radar multipath without direct-line-of-sight (DLOS). This revolutionary capability is finding new applications in the tracking of objects in non-line-of-sight (NLOS) urban environments including detection and tracking of UAVs. This book brings together for the first time all the essential underpinnings and techniques required to develop and field

a viable NLOS radar. It presents many examples, including electromagnetic radiation propagation in urban NLOS environments, extracting building location and morphology from readily available terrain databases, predictive ray-tracing techniques, and multi-target NLOS tracking.

Contents: Introduction; Review of Ground Surveillance Sensors; Exploiting Multipath Physics in Detection and Tracking; Databases; High-fidelity modeling and simulation; Computing Hardware Acceleration Strategies.

Hardcover • 280 pp. • 2018 • ISBN: 978-1-63081-531-8 • [\\$149](#)

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The Micro-Doppler Effect in Radar, Second Edition

Victor C. Chen
Hardcover • 342 pp. • 2018 • ISBN: 978-1-63081-546-2 • [\\$139](#)

Meter-Wave Synthetic Aperture Radar for Concealed Object Detection

Hans Hellsten
eBook • 376 pp. • 2017 • ISBN: 978-1-63081-446-5 • [\\$134](#)

MIMO Radar: Applications for the Next Generation

Jamie Bergin and Joseph R. Guerci
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Hugh D. Griffiths and Christopher J. Baker
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Nickolas Kingsley and Joseph R. Guerci
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Olis Rubin
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J.R. Guerci
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Sergey M. Smolskiy, Viacheslav M. Davydochkin, Valery S. Parshin, Boris A. Atayants, and Victor V. Eserskiy
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eBook • 232 pp. • 2014 • ISBN: 978-1-60807-666-6 • [\\$123](#)

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David K. Barton
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Martin Adams, John Mullane, Ebi Jose, and Ba-Ngu Vo
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Adrian K. Fung
eBook • 328 pp. • 2015 • ISBN: 978-1-63081-001-6 • [\\$127](#)

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Fawwaz T. Ulaby and David G. Long
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Jeffrey Nanzer
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Naser El-Sheimy, Caterina Valeo, and Ayman Habib
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Niels Skou and David M. Le Vine
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Adrian K. Fung and Kun-Shan Chen
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William J. Blackwell, Frederick W. Chen
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Andrew K. Chan and Cheng Peng
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Samuel Blackman and Robert Popoli
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COMING SOON!
Practical Geolocation for Electronic Warfare Using MATLAB®

Nicholas O'Donoghue

This text explores the practical realities that arise from the employment of geolocation for electronic warfare in real-world systems, including position of the target, errors in sensor position, orientation, or velocity, and the impact of repeated measurements over time. The problems solved in the book have direct relevance

to accurately locating and tracking UAVs, planes, and ships. As a companion volume to the author's previous book Emitter Detection and Geolocation for Electronic Warfare (Artech House, 2019), this book goes in depth on real-world complications that include: working within and converting between different coordinate systems, incorporation of prior information about targets, sensor uncertainties, the use of multiple snapshots over time, and estimating the current position and velocity of moving targets. The e-book version described here includes several links to software and videos that can be downloaded from the publicly available Git repository. The book also includes all MATLAB code necessary to develop novel algorithms that allow comparisons to classical techniques and enable you to account for errors in timing, position, velocity, or orientation of the sensors.

Contents: Review of Emitter Geolocation. Sensor Selection. Coordinate Systems. Geolocation with Target Constraints. Geolocation with Sensor Uncertainties. Geolocation with Multiple Snapshots. Geolocation of Moving Targets. Derivation of the Fisher Information Matrix for Phase, Delay, and Doppler Estimation.

E-Book. 220 pp. July 2022. 978-1-63081-888-3. [\\$139](#)



COMING SOON!
Developing Digital RF Memories and Transceiver Technologies for Electromagnetic Warfare

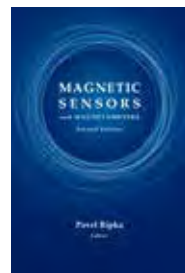
Phillip E. Pace

This exciting new resource provides the latest in design concepts and the current state of technology in digital radio frequency memories (DRFM), focusing on the techniques used in electronic warfare. The design of amplitude sampling and phase sampling DRFM are explored, and their trade-offs

evaluated. The book helps readers understand the many applications that can benefit from the use of a DRFM and how to develop models for different DRFM configurations. It explores the design trade-offs in developing multiple, structured, false target synthesis DRFM architectures and aids in developing counter-DRFM techniques and distinguish false target from real ones. Written by an expert in the field, and including MATLAB™ design software, this is the only comprehensive book written on the subject of DRFM.

Contents: Architectures, Design Techniques and Tradeoffs; Circuit Design Concepts and Mathematical Models; DRFMs in Electronic Attack; Processor Augmentation for Superior RF Decoys; Electronic Protection Methods Against DRFM False Targets; Integrated Photonic DRFM Techniques; Superconductor Electronics.

Hardcover • 828 pp. • June 2022 • ISBN: 978-1-63081-697-1 • [\\$149](#)



RECENT RELEASE
Magnetic Sensors and Magnetometers, Second Edition

Pavel Ripka

This completely updated second edition of an Artech House classic covers industrial applications and space and biomedical applications of magnetic sensors and magnetometers. With the advancement of smart grids, renewable energy resources, and electric vehicles, the importance of electric current

sensors increased, and the book has been updated to reflect these changes. Integrated fluxgate single-chip magnetometers are presented. GMR sensors in the automotive market, especially for end-of-shaft angular sensors, are included, as well as Linear TMR sensors. Vertical Hall sensors and sensors with integrated ferromagnetic concentrators are two competing technologies, which both brought 3-axial single-chip Hall ICs, are considered. Digital fluxgate magnetometers for both satellite and ground-based applications are discussed. All-optical resonant magnetometers, based on the Coherent Population Trapping effect, has reached approval in space, and is covered in this new edition of the book.

Contents: Basics; Induction sensors; Fluxgate sensors; Ferromagnetic Magneto-Resistive sensors; Hall-Effect Magnetic Sensors; Resonant magnetometers; SQUID; Magneto-optical sensors and other principles; Applications magnetic field sensors and magnetometers; Testing and calibration instruments; Magnetic sensors for non-magnetic variables.

Hardcover • 416 pp. • 2021 • ISBN: 978-1-63081-642-8 • [\\$219](#)



RECENT RELEASE
Cognitive Electronic Warfare: An Artificial Intelligence Approach

Karen Zita Haigh, Julia Andrusenko

This comprehensive book gives an overview of how cognitive systems and artificial intelligence (AI) can be used in electronic warfare (EW). Readers will learn how EW systems respond more quickly and effectively to battlefield conditions where sophisticated radars and spectrum congestion put

a high priority on EW systems that can characterize and classify novel waveforms, discern intent, and devise and test countermeasures. Specific techniques are covered for optimizing a cognitive EW system as well as evaluating its ability to learn new information in real time.

Contents: Intro to Cognitive EW; Objective Function; Machine Learning Primer; Electronic Support; Electronic Protect and Electronic Attack; Electronic Battle Management; Real-time In-mission Planning and Learning; Data Management; Architecture; Test and Evaluation.

Hardcover • 288 pp. • 2021 • ISBN: 978-1-63081-811-1 • [\\$149](#)



Sensor Management in ISR

Kenneth J. Hintz

This book introduces and details the information-based sensor management (IBSM) approach to real-time orchestrated resource management (ORM) of intelligence, surveillance, and reconnaissance (ISR) assets in the physical, cyber, and social domains. This is the first book which partitions the ISR sensor management process into partitioned functions which can be studied and optimized independently of each other

through defined conceptual interfaces.

Hardcover • 250 pp. • 2020 • ISBN: 978-1-63081-685-8 • [\\$149](#)



Designing Wireless Sensor Network Solutions for Tactical ISR

Tim Cole

This exciting resource presents specifics that define “tactical” intelligent surveillance & reconnaissance (T-ISR) by providing architectural design rules and applications, along with examples for sensor and data extraction fields. Descriptions of appropriate sensor modalities, wireless sensor networking structures, systems engineering in the selection

& implementation phases, example systems, seamless integration into existing ISR systems are discussed. The seldom-discussed tactical ISR systems versus that associated with large-scale strategic systems is detailed. This text fills in the technical gap left by current publications and ISR courses.

Contents: Introduction; Introduction to T-ISR; T-ISR Sensor Systems; Sensor Key Performance Parameters (KPPs); T-ISR Target Signatures & Identification Issues; WSN node Hardware; Data, Command & Control Communications; WSN Node & Wireless Self-Organizing Level Sensor Systems – Optical; WSN Node & Wireless Self-Organizing Level Sensor Systems – RF; WSN Node & Wireless Self-Organizing Level Sensor Modalities; T-ISR Sensor Architecture Engineering; Localization & Geolocation; Power Management; Security; T-ISR System Deployment; WSN Application to T-ISR Missions (Case Studies).

Hardcover • 340 pp. • 2020 • ISBN: 978-1-63081-337-6 • [\\$169](#)



Cyberwarfare: An Introduction to Information-Age Conflict

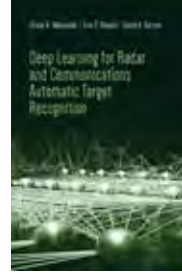
Isaac R. Porche III

Conflict in cyberspace is becoming more prevalent in all public and private sectors and is of concern on many levels. As a result, knowledge of the topic is becoming essential across most disciplines. This book reviews and explains the technologies that underlie offensive and defensive cyber operations, which are practiced by a range of cyber actors including state actors, criminal enterprises, activists, and individuals.

It explains the processes and technologies that enable the full spectrum of cyber operations. Readers will learn how to use basic tools for cyber security and pen-testing, and also be able to quantitatively assess cyber risk to systems and environments and discern and categorize malicious activity.

Contents: Part I: Key concepts of information age conflict: Characteristics and definitions of Cyberspace, Cybersecurity, Information Security, Information Warfare and Electronic Warfare; The life cycle of a cyber attack / Steps of Cyber Attacks; Calculating cyber risk (threats and vulnerabilities); The legalities of information age conflict; Part II: Fundamentals of Information Communication Technologies: Digital communications; Networking Technologies; Packet Switched Networking; Internet protocols; The Internet and its underlying architectures; Part III: Cyberwar Tools, Techniques, and Procedures: Reconnaissance techniques for offensive cyber operations; Scanning tools and techniques for offensive cyber operations; Exploitation tools and techniques for offensive cyber operations; Electronic Warfare; Part IV: Cybersecurity Tools, Techniques, and Procedures: Tools and techniques for identifying threats and vulnerabilities; Tools and techniques for protecting assets from threats and vulnerabilities (encryption); Tools and techniques for detecting attacks; Tools and techniques for responding to attacks; Tools and techniques for recovering from attacks; Part V: Case Studies: Vulnerabilities and exploits in Automotive and Surface Transportation Sector; Vulnerabilities and exploits of industrial control systems; Vulnerabilities and exploits in maritime; Vulnerabilities and exploits of voting machines; Vulnerabilities and exploits of social media and Information Warfare.

Hardcover • 370 pp. • 2019 • ISBN: 978-1-63081-576-9 • [\\$159](#)



Deep Learning for Radar and Communications Automatic Target Recognition

Uttam K. Majumder, Erik P. Blasch, David A. Garren

This authoritative resource presents a comprehensive illustration of modern Artificial Intelligence / Machine Learning (AI/ML) technology for radio frequency (RF) data exploitation. It identifies technical challenges, benefits, and directions of deep

learning (DL) based object classification using radar data, including synthetic aperture radar (SAR) and high range resolution (HRR) radar. The performance of AI/ML algorithms is provided from an overview of machine learning (ML) theory that includes history, background primer, and examples. Radar data issues of collection, application, and examples for SAR/HRR data and communication signals analysis are discussed. In addition, this book presents practical considerations of deploying such techniques, including performance evaluation, energy-efficient computing, and the future unresolved issues.

Contents: Introduction to Machine Learning and Radio Frequency: Past, Present, and Future; Mathematical Foundations for Machine Learning; Review of Machine Learning Algorithms; A Review of Deep Learning Algorithms; Radio Frequency Data for ML Research; Deep Learning for Single-Target Classification in SAR Imagery; Deep Learning for Multiple Target Classification in SAR Imagery; RF Signal Classification; Radio Frequency ATR Performance Evaluation; Recent Topics in Machine Learning for Radio Frequency ATR.

Hardcover • 300 pp. • 2020 • ISBN: 978-1-63081-643-8 • [\\$179](#)



RF Electronics for Electronic Warfare

Richard A. Poisel

This exciting new resource investigates the function of RF communication in electronic warfare systems. The book provides in-depth coverage of how RF signals must be constructed to perform jamming missions, which prevent a receiver from properly extracting a target signal. Technical descriptions of oscillators and modulators, which generate the RF signals, are presented and explored. Power supplies that generate

adequate power for fueling high power amplifiers are also described and their operations investigated.

Contents: Introduction; Modulation and Modulators; EW Exciters; Introduction to RF Amplifiers; Semiconductor Technologies; BJT Amplifiers; MOSFET Amplifiers; Biasing Active Devices; RF Power Amplifiers; Amplifier Stability; Power Amplifier Linearity; Thermal Management of RF Power Amplifiers; Power Supplies for RF Power Amplifiers.

Hardcover • 696 pp. • 2019 • ISBN: 978-1-63081-705-3 • [\\$179](#)



Introduction to Modern EW Systems, Second Edition

Andrea De Martino

In answer to great demand, Artech House is proud to bring you a newly revised and updated edition of the bestselling book Introduction to Modern EW Systems. The second edition has been greatly expanded to include a wealth of new material, from remote piloted airborne systems, directed energy weapons, and non-cooperative air surveillance... to EW radar band sensor next generation architectures, real-time data links, and smart jamming.

Contents: Introduction to EW Scenarios; Evolution of Signal Emitters/Sensors; EW RF Band Sensor Systems; RF Direction Finding (DF) and Emitter Location Techniques; ECM Systems; ECM Techniques and Sensor's ECCM; Appendices.

Hardcover • 500 pp. • 2018 • ISBN: 978-1-63081-513-4 • [\\$169](#)



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 you insight 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.

Contents: Introduction; Scenario-Based Capability Planning in Command and Control Context; Communications Systems; Situational and Context Awareness; Radio Wave Propagation; Wireless Sensor Networks; Software-Defined and Cognitive Radios; Unmanned Ground and Aerial Platforms; Analysis of Selected Communications Alternatives Related to Scenario; Conclusion.

Hardcover • 228 pp. • 2018 • ISBN: 978-1-63081-333-8 • [\\$139](#)



Introduction to Electronic Defense Systems, Third Edition

Filippo Neri

This extensively revised and expanded edition of an Artech House bestseller delivers the most up-to-date overview of electronic defense systems. Bringing you up-to-speed with the latest technological advances, the third edition details a completely new method of implementing these modern systems. Moreover, this edition is packed with updated illustrations of key assets, including aircraft, ships, and radars.

Readers get a solid understanding of how sophisticated electronic warfare weapon systems work, and how these weapons can be intercepted and electronically jammed. From search and tracking radar, IR systems, and communication systems to electronic intercept systems, countermeasures, and counter-countermeasures, the book explores a broad spectrum of defense equipment. It explains how these systems operate, the advantages and drawbacks of each system, and the theories on which these systems are based.

Contents: Electronic Defense; Sensors; Weapon System; Electronic Intercept Systems; Electronic Countermeasures Systems; Electronic Counter Countermeasures Systems; New Electronic Defense Techniques and Technologies; Design and Evaluation Criteria.

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The Artech House Bestselling EW 100 Series

David L. Adamy

This popular EW (electronic warfare) book series features highly informative and easy-to-comprehend tutorials. Organised into chapters with introductory and supplementary material from the author, engineers get clear, concise and well-illustrated examinations of electronic warfare topics, from EW processing and jamming, to spectrum spreading and emitter location systems, to tactical communication radio propagation and detection and jamming of LPI signals.

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Contents: Introduction; Basic Mathematical Concepts; Antennas; Receivers; EW Processing; Search; LPI Signals; Emitter Location; Jamming; Decoys; Simulation; Appendix A; About the Author; Index.

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Practical ESM Analysis

Sue Robertson

The book explains phenomena seen in ESM systems with examples of how to recognize issues in the ESM data and solutions. Techniques for visualizing ESM data and how to set up ESM trials are given. The identification of radars by ESM systems is considered with ideas presented on how to generate an effective radar library.

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JUST PUBLISHED
5G-Enabled Industrial IoT Networks

Amitava Ghosh, Rapeepat Ratasuk, Simone Redana, and Peter Rost

This one-of-a-kind book gives you an exclusive look into how the “Industrial Internet of Things” (IIoT) convergence with the 5G end-to-end network is driving the 4th industrial revolution and bringing about game-changing developments in multiple industries. The book shows you how 5G-driven IIoT

networks can deliver optimal performance for all industrial applications using key LTE and 5G NR features, and helps you understand how IIoT with 5G can be used to automate factories and make them more cost efficient. deeper understanding of the role of machine learning in the IIoT revolution. With its international scope and focus on 5G IIoT networks and performance, this is an important read for global technology leaders in telecom and manufacturing industries, analysts and technical writers for various industry magazines and newspapers, telecom researchers, and anyone needing to understand the current state of the art in this rapidly developing technology.

Contents: Introduction, Requirements and Use Cases. IIoT Standards, Spectrum and Alliances. 3GPP End-to-End Network Architecture for IIoT. End-to-End Service Support for IIoT. IIoT Enablers in New Radio (NR). User Equipment (UEs) and Sensors for IIoT

Hardcover • 260 pp. • 2022 • ISBN: 978-1-63081-855-5 • [\\$149](#)



In-Band Full-Duplex Wireless Systems Handbook

Kenneth E. Kolodziej

Many wireless systems could benefit from the ability to transmit and receive on the same frequency at the same time, which is known as In-Band Full-Duplex (IBFD). This technology could lead to enhanced spectral efficiency for future wireless networks, such as fifth-generation New Radio (5G NR) and beyond, and could enable capabilities and applications that were previously considered

impossible, such as IBFD with phased array systems. In this exciting new book, experts from industry, academic, and federal research institutions discuss the various approaches that can be taken to suppress the inherent self-interference that is generated in IBFD systems.

Contents: Section 1: Propagation-Domain Techniques: Chapter 1: In-Band Full-Duplex Overview; Chapter 2: Antenna Subsystems; Chapter 3: Electrical Balance Duplexers; . Chapter 4: Nonmagnetic Circulators; Chapter 5: Photonic-Based Antenna Interfaces; Section 2: Analog-Domain Techniques: Chapter 6: Code-Based RF Filtering; Chapter 7: Photonic-Based RF Filtering; Chapter 8: Time-Domain RF Cancellation; Chapter 9: Frequency-Domain RF Cancellation; Chapter 10: Digitally-Assisted RF Cancellation; Section 3: Digital-Domain Techniques: Chapter 11: Spline-Based Nonlinear Digital Cancellation; Chapter 12: Reference-Based Nonlinear Digital Cancellation; Section 4: Systems and Applications: Chapter 13: Phased Array Systems; Chapter 14: Multiple-Input Multiple-Output Array Systems; Chapter 15: Photonic-Based Cancellation Systems; Chapter 16: Backscatter Modulation Applications; Chapter 17: Military Applications

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Spectrum Wars: The Rise of 5G and Beyond

Jennifer A. Manner

This timely book guides you through the complex regulatory and technical changes in spectrum use and management brought on by the rise of 5G and beyond. It reviews the current operational and commercial context of mobile, drone, and satellite wireless technologies and 5G spectrum needs, then gives you an expert look into the projected

regulatory and technical changes intended to enable more efficient use of the spectrum bands. You will know the key issues and challenges ahead in spectrum management, understand tools used to increase 5G spectrum efficiency, learn through case studies, and more. This is a great resource for anyone in the wireless world who needs to know how the spectrum resource is used and how decisions are made.

Contents: Introduction: The Changing World of Spectrum; The Evolving International Spectrum Regulatory Landscape; The Evolving Domestic Spectrum Regulatory Landscape; 5G Technology Overview; 5G and Beyond: Drivers of Change, Use Cases Driving 5G, Future Challenges and the Race to Be First; Meeting the Growing Demand for Spectrum for 5G for All Technologies; Enabling the Use of Additional Spectrum for 5G; 6G and Beyond; Conclusion: Challenges Ahead.

Hardcover • 240 pp. • 2021 • ISBN:978-1-63081-916-3 • [\\$129](#)



Wi-Fi 6 Protocol and Network

Susinder Rajan Gulasekaran and Sundar Gandhi Sankaran

This book provides an in-depth technical overview of six generations of Wi-Fi standards covering protocol, implementation, and system deployment aspects. The new features and capabilities of the latest sixth generation standard called Wi-Fi6 and its security are described. Alternate use cases of Wi-Fi are addressed, including 60 GHz Wi-Fi (802.11ad/ay) and indoor positioning using Wi-Fi. Wi-Fi6 is

described as it compares 5G technology. Readers will understand practical implementation challenges, problems and common solutions relevant to Wi-Fi deployment in different environments.

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An Introduction to Optical Wireless Mobile Communications

Harald Haas, Mohamed Sufyan Islam Cheng Chen and Hanaa Abumarshoud

The book discusses existing conventional radio frequency (RF)-based wireless access technology and presents the challenges that can impact the requirements of the future wave of new wireless services in the context of artificial intelligence (AI) driven autonomous systems and machine-type

communications. The relationship between visible light communications (VLC) and light fidelity (LiFi), is explored, and the major advantages of VLC and LiFi such as security and data density, and discuss existing research challenges are also introduced.

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

Ed Birrane and Jason A. Soloff

This exciting book explores motivation, characteristics, and examples how network application engineers benefit from new store-and-forward protocols. The motivating factors that caused delay tolerant networks (DTNs) to be standardized are discussed, as well as the unique nature of applications running within a DTN. The underpinnings

of DTN development are explored, including space-based networking, Internet of Things communications, and delayed-overlays as a means of achieving quality-of-service.

Hardcover • 340 pp. • 2020 • ISBN: 978-1-63081-628-5 • [\\$175](#)



Handbook of Next-Generation Emergency Services

Barbara Kemp and Bart Lovett

This book presents Next Generation Emergency Services, to help implementers, regulators, legal and technical professionals to understand how the introduction of this new approach to delivering emergency services will impact their work. Beginning with an overview of the field and explaining what will change as the transition is made from circuit-switched to IP-based networks, the book

provides guidance and detail related to the technologies that enable Next Generation services; the current state of emergency services; how to plan and execute a move to a standards-compliant NG9-1-1 service including the network design, the operations and maintenance procedures, and the legal and regulatory requirements and mandates.

Contents: Next Generation Emergency Services; Anatomy of NG9-1-1 Implementation; Infrastructure; Neighboring Jurisdictions; Access Carriers – Originating Service Providers; Large Customers; Test Plans – Key Components and Samples; Cutover; Ongoing Operations; Emerging Solutions; Legal and Regulatory Financial; International Market for Next Generation Emergency Services.

Hardcover • 270 pp. • 2020 • ISBN: 978-1-63081-652-0 • [\\$139](#)



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. The book also considers what can be achieved with ferrite-based circulators in terms of size reduction and performance enhancement, especially at millimetric frequencies. The relative merits of ferrite and non-ferrite circulators are compared in terms of

their fundamental materials and device technologies.

Contents: Full Duplexing; Self Interference; SI reduction-Solutions from Academic Groups; Non-Reciprocal Magnetism Physics; Practical Spatio-Temporal circulation approaches; Limitations of Semiconductor based Circulators; Current Ferrite Circulator Technology; Unbiased Ferrite Devices; Newer Transmission Line Technologies; New Materials and Packaging; Comparison of Ferrite and Semi-conductor based Circulators for Full Duplex; Future Full Duplex 5G Applications.

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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.

Contents: Radio systems; Amplifiers; Mixers and special functions; Phase Lock Loops; Analog/Digital converters.

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Y. J. Liu

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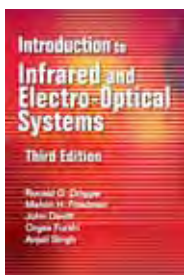
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Ronald G. Driggers, Melvin H. Friedman, John Devitt, Orges Furxhi, Anjeli Singh

This newly revised and updated edition offers a current and complete introduction to the analysis and design of Electro-Optical (EO) imaging systems. The Third Edition provides numerous updates and several new chapters including those covering Pilotage, Infrared

Search and Track, and Simplified Target Acquisition Model. The book contains over 800 time-saving equations and includes numerous analyses and designs throughout. It also includes a reference link to special website prepared by the authors that augments the book in the classroom and serves as an additional resource for practicing engineers. With its comprehensive coverage and practical approach, this is a strong resource for engineers needing a bench reference for sensor and basic scenario performance calculations. Numerous analyses and designs are given throughout the text. It is also an excellent text for upper-level students with an interest in electronic imaging systems.

Contents: Introduction to imaging. Mathematics. Diffraction. Sources of Radiation. Atmospheric. Optics. Detectors. Electronics. Image Processing. Displays, Human Perception, and Automatic Target Recognizers. Historical Performance Models. Contrast Threshold and TTP Metric. Infrared and EO System Performance and Target Acquisition. Simplified Targeting Model. Pilotage. Infrared Search and Track. Search. Laboratory Measurements of Infrared imaging and Performance. Appendix.

Hardcover. 951 pp. August 2022. ISBN 978-1-63081-832-6. [\\$215](#)



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THE FIBER-OPTIC GYROSCOPE, Third Edition

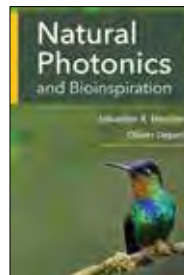
Hervé Lefèvre

Now in its third edition, this landmark reference provides you with a complete system analysis of the fiber optic gyroscope and remains unmatched by any other single source. The book provides everything you need to know about optics, single-mode fiber optics and integrated optics to fully grasp the design rules of the fiber optic gyroscope. It also

walks you through the most recent advances and helps you understand the key concepts and preferred solutions for obtaining a practical device. The author is a leading expert in this field and is one of the early pioneers of the practical optical architecture and signal processing technique that is universally used in today's FOGs. This is a must-have book for optoelectronics engineers and anyone needing to stay abreast of the current concepts and most recent advances in FOGs.

Contents: Introduction; Principle of the Fiber-Optic Gyroscope; Reciprocity of a Fiber Ring Interferometer; Backreflection and Backscattering; Analysis of Polarization Non reciprocities with Broadband Source and High-Birefringence Polarization-Maintaining Fiber; Time Transience-Related Non reciprocal Effects; Truly Nonreciprocal Effects; Scale Factor Linearity and Accuracy; Recapitulation of the Optimal Operating Conditions and Technologies of the I-FOG; Alternative Approaches for the I-FOG; Resonant Fiber-Optic Gyroscope (R-FOG); Conclusions.

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RECENT RELEASE
NATURAL PHOTONICS AND BIOINSPIRATION

Sébastien R. Mouchet and Olivier Deparis

Photonic structures occurring in biological tissues such as butterfly wings, beetle elytra or fish scales are responsible for a broad range of optical effects including iridescence, narrow-band reflection, large solid-angle scattering, polarization effects, additive color mixing, fluid-induced color changes, controlled fluorescence. Studies have

provided understanding of the underlying optical mechanisms and the biological functions as well as inspiration for the design and development of novel photonic devices, also called bioinspiration. In this forward-thinking book, the research related to photonic structures in natural organisms is reviewed with a main focus on bioinspired applications.

Contents: Part 1 – Basic concepts: Photonics in nature; Diversity and complexity of natural photonic devices; Part 2 – Natural photonic devices: a palette of effects: Color additive devices; Transparent devices; Structural color changes induced by contact with liquids; Other forms of structural color changes; Solar energy harvesting devices; Light emission management devices; Part 3 – Bioinspired photonic devices: design and fabrication: Design; Fabrication; Bio-inspired hygrochromic materials; Part 4 – Bioinspired applications: Optical displays; Antireflective coatings; Anti-counterfeiting; Sensing; Light harvesting; Light extraction; Conclusion.

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Fabio Cavaliere and Antonio D'Errico
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Big Data Analytics for Connected Vehicles and Smart Cities

Bob McQueen

This practical book presents you with the application of “big data” analytics to connected vehicles, smart cities, and transportation systems. This book enables you to understand how data analytics can and will expand the design and engineering of connected vehicles and smart cities. You will find extensive case studies and examples that provide

a strong framework focusing on the practical application of data sciences and analytic tools for actual projects in the field.

Contents: Questions to be Addressed; What is Big Data?; The Connected Vehicle; Smart Cities; What are Analytics?; Analytics Applications; Use Cases; Building a Data Lake; Case Studies; Benefits and Costs; Summary.

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Richard Bishop

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Bob McQueen, Rick Schuman, and Geoff Halstead

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Sensor Technologies and Data Requirements for ITS

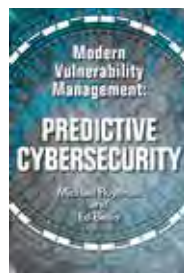
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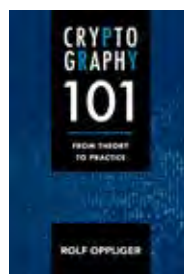
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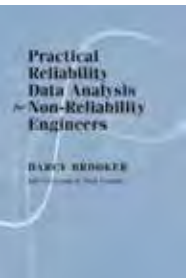
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insight into designing for the future, including design quality and future proof intelligent buildings, and whole life value.

eBook • 316 pp. • 2017 • ISBN: 978-1-63081-441-0 • [\\$47](#)



Applications of Energy Harvesting Technologies in Buildings

Joseph W. Matiko and Stephen P. Beeby

This timely resource explores the available energy sources within commercial and residential buildings and the available technologies for energy harvesting. Energy harvesting within built environments is presented using strong research and commercial examples. This book includes clear and concise case studies on solar cell powered

sensor nodes for emotion monitoring systems in ambient assistive living environments and inductive/RF power transfers. Thermoelectric energy harvesting and power management circuit design, airflow and vibration energy harvesting is also explored.

eBook • 230 pp. • 2017 • ISBN: 978-1-63081-410-6 • [\\$78](#)



Advanced Technology for Smart Buildings

James Sinopoli

Authored by a recognized expert in the field, this timely resource introduces technologies that can be used for advanced smart buildings, including renewable power, communications, indoor positioning, security management, and control systems. This book speaks to the innovation of advanced technology, particularly information technology within the building industry today and

explores the potential benefits and issues with advanced technology and its applications and presents practical real-world case studies.

Hardcover • 222 pp. • 2016 • ISBN: 978-1-60807-865-3 • [\\$159](#)

Implementing Successful Building Information Modeling

Erika Epstein

Hardcover • 282 pp. • 2012 • ISBN: 978-1-60807-139-5 • [\\$129](#)

Embedded Commissioning of Building Systems

Omer Akin

Hardcover • 300 pp. • 2011 • ISBN: 978-1-60807-147-0 • [\\$129](#)



COMING SOON!
Energy Storage Technologies and Applications

C. Michael Hoff

This book gives you a broad look at all different energy storage technologies, from the past and into the future. It takes a hard look at the advantages and disadvantages of various technologies, but also the different applications of energy storage to determine the attributes that are most important for the technology one would choose for them. The book guides

you through the hidden costs and true advantages of today's energy storage technologies, and helps you understand energy storage technologies' specifications and claims to uncover which are important to their applications. You'll find lessons learned from industry experts as they strove to pave new roads in the development of energy storage technologies and their markets. This is an excellent resource for project developers and anyone who needs to be needs to a broad understanding of what matters in energy storage.

Contents: A brief history of storing energy using electricity. Applications of energy storage on the grid. Mechanical energy storage. Hydroelectric energy storage. Thermodynamic energy storage. Electrochemical energy storage

Hardcover. 340 pp. July 2022. ISBN 978-1-63081-908-8. [\\$139](#)



Sustainable Power, Autonomous Ships, and Cleaner Energy for Shipping

John Erik Hagen

This exciting new book highlights and discusses new concepts for enhanced efficiency of ships and how they are operated, primarily resting on reducing the environmental footprints and operational expenses. An overview of technological and regulatory developments and drivers for the challenges described above is provided. Readers learn about sustainable

energies and power for propulsion, particularly maritime electrification. The book includes shore-based initiatives on greenhouse gas reduction in shipping. Status and current practices for propulsion arrangements using renewable energy technologies are presented with examples on ships representing several categories of energies and power. Energy solutions that enable future digital and automated concepts for safe, secure and cost-effective sustainable shipping are discussed, as well as the concept of autonomous ships as part of maritime electrification and all the possibilities.

Contents: Sustainable Shipping and Renewable Energies and Power Technologies; Renewable technology energy status and current practices for sustainable power and propulsion arrangements; Autonomous ships; Projects related to autonomous ships; Gaps in regulations and standards for autonomous ships; The Future

Hardcover • 300 pp. • 2021 • ISBN: 978-1-63081-799-2 • [\\$149](#)

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Renewable Energy Technologies and Resources

Nader Anani

This exciting new book presents an excellent coverage of renewable energy technologies and resources. The book focuses on photovoltaics, hydro, tidal, wind, and biomass systems. It explains the scientific principles and physical systems used for harvesting and harnessing of renewable resources and makes comprehensive use of worked examples and problems.

Contents: Introduction: Basic Concepts; Photovoltaics Part I: Background Material; Photovoltaics Part II: Characteristics and Circuit Modelling of PV Cells; Photovoltaics Part III: PV Arrays Operation and Characteristics; Photovoltaics Part IV: PV Generating Systems; Hydro Energy; Tidal Energy; Wind Energy; BioEnergy; Costing a Renewable Energy Project.

Hardcover • 250 pp. • 2019 • ISBN: 978-1-63081-573-8 • [\\$149](#)



Lithium-Ion Batteries and Applications, Volume 1: Batteries

Davide Andrea

Volume One focuses on the Lithium-ion cell and its types, formats, and chemistries. Cell arrangements and issues, including series (balance) and parallel (fusing, inrush current) are also discussed. Lithium-ion Battery Management Systems are explored, focusing on types and topologies, functions, and selection.

Hardcover • 600 pp. • 2020 • ISBN: 978-1-63081-767-1 • [\\$159](#)



Lithium-Ion Batteries and Applications, Volume 2: Applications

Davide Andrea

Volume Two focuses on small batteries in consumer products and power banks, as well as large low voltage batteries in stationary or mobile house power, telecom, residential, marine and microgrid. Traction batteries, including passenger, industrial, race vehicles, public transit, marine, submarine and aircraft are also discussed.

Hardcover • 480 pp. • 2020 • ISBN: 978-1-63081-769-5 • [\\$159](#)



Microgrid Design and Operation Toward Smart Energy in Cities

Frederico Delfino, Renato Procopio, Mansueto Rossi, Stefano Bracco, Massim Brignone, and Michela Robba

Based on the extensive real-world experience of the authors, this cutting-edge resource provides a basis for the design, installation, and day-by-day management of microgrids.

Contents: Introduction; Technology Overview: Devices and Equipment; Microgrid Installations: State of the Art; Communication and Monitoring Systems for Microgrids; Modelling and Simulation for Microgrids; Optimization for Microgrid Planning; Optimization for Microgrid Management; Forecasting Tools; Islanded Microgrids; Commercial Tools for the Management of Microgrids; From Design to on Field Installation: A Practical Case Study; From Microgrids to Smart Cities.

eBook • 336 pp. • 2018 • ISBN: 978-1-63081-151-8 • [\\$104](#)



Lithium-Ion Battery Failures in Consumer Electronics

Ashish Arora, Sneha Arun Lele, Noshirwan Medora, and Shukri Sourì

This comprehensive resource caters to system designers that are looking to incorporate lithium ion (li-ion) batteries in their applications. Detailed discussion of the various system considerations that must be addressed at the design stage to reduce the risk of failures in the field is presented.

Contents: Li-ion Cells: Types and Constructions; Commonly used Terminology; Li-ion Energy Storage System Design; AC Adapters and their Requirements; Li-ion Battery Charger Requirements and Designs; Battery Protection Circuit Considerations; Industry and Abuse Standards; Physical Construction of Battery Packs; Field Failures and Investigation Tools; Fire Investigations; System Checklists.

Hardcover • 238 pp. • 2019 • ISBN: 978-1-63081-603-2 • [\\$139](#)



Plug-in Electric Vehicle Grid Integration

Islam Safak Bayram and Ali Tajer

This authoritative resource introduces you to plug-in electric vehicles (PEVs), energy storage, and converter technology. The architecture for sustainable charging infrastructures and capacity planning of small scale fast charging stations are explored. This book highlights how PEVs provide services to the grid and how to build and design sustainable transportation systems.

Contents: Part 1 – Electrification of Light-Duty Vehicles; Introduction to Plug-In Electric Vehicles; Enabling Technologies; Bottlenecks for Electric Vehicles Penetration; Part 2 – Architectures, Control, and Optimization; Battery Model; Charging Facility Design; Capacity Planning of a Large Scale Plug-In Vehicle; Capacity Planning of Small Scale Fast Charging Stations; Optimal Arrival Rates; Optimal Service Rates; Facility Location Problem; Load Balancing and Demand Forecast; Part 3 – PEVs for Ancillary Services; Vehicle-to-Vehicle Technology; Vehicle-to-Grid Technology; Miscellaneous.

Hardcover • 276 pp. • 2017 • ISBN: 978-1-63081-051-1 • [\\$149](#)



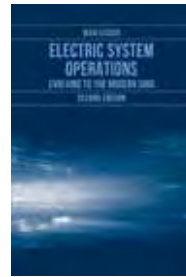
The Smart Grid as an Application Development Platform

George Koutitas and Stan McClellan

This authoritative resource explores the power grid from its classical role as a utility or service provider towards its new role as an application development platform.

Contents: Smart Grid Model; The Power Grid at a Glance; Drawbacks of Current Network Design; Smart Grid Elements; The Cloud Environment of Application Providers; User Centric Applications; Transactive Energy Economy; Summary and Conclusions.

Hardcover • 220 pp. • 2017 • ISBN: 978-1-63081-109-9 • [\\$103](#)



Electric System Operations: Evolving to the Modern Grid, Second Edition

Mani Vadari

This completely updated second edition includes case studies and focuses on the business of system operations. The broad range of actions under system operations – all the way from transmission to distribution is also explained.

Contents: Introduction; Define System Operations; Introduction to Power Systems; Impact of Deregulation on System Operations; Business of System Operations; Control Center the Hub of System Operations; Energy Management Systems; Outage Management Systems; Distribution Management Systems; Distributed Energy Management System; System Operator Training Simulators; Conclusions.

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Smart Grid Redefined: Transformation of the Electric Utility

Mani Vadari

Written by a leading expert in the utility field, this practical resource guides you in the evolution of the Smart Grid and offers insight into distribution automation, storage, and microgrid. This book highlights the journey to electric utility 3.0 and provides solid examples and includes real-world case studies.

Contents: Introduction; Smart Grid Redefined; Distribution Automation-Path to a Self-Healing Grid; Energy Storage-Electric Value Chain Disruptor; Distributed Energy Resources-Challenge of Integrating Supply/Demand Diversity; Microgrids-Fragmentation of the Grid; Data Analytics-Bringing Intelligence to the Grid; Electric Transportation-First Mover to a Mobile Carbon-Free Future; Smart Homes and building-The Final Frontier; Electric Utility Transformation; Transformed Utility-Springboard to a Smart City.

Hardcover • 370 pp. • 2018 • ISBN: 978-1-63081-476-2 • [\\$159](#)



A Systems Approach to Lithium-Ion Battery Management

Phil Wecker

This book covers practical and analytic concepts for the design, optimization, selection and analysis of battery management systems for large format lithium-ion battery packs. Automotive and stationary energy storage applications are discussed.

Contents: Introduction; Lithium Ion Battery Fundamentals; Battery Management System Fundamentals; Architectures; Measurement; Control; High Voltage Electronics Fundamentals; Communications; Power Limit Algorithms; Charge Balancing; SOC Estimation Algorithms; SOH Estimation Algorithms; Fault Detection; Hardware Implementation; Software Implementation; Safety; Robustness and Reliability; Best Practices; Future Developments.

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Contents: Introduction, What Is A Sales Engineer?, An Overview Of The Sales Process, Lead Qualification, The RFP Process, Technical Discovery, Business Value Discovery I – Pains and Gains, Business Value Discovery 2 – Time, Money and People, The FABulous Sales Engineer, Successful Customer Engagement, The Perfect Pitch: Structure, The Perfect Pitch:

Delivery, The Dash To Demo, Building The Demo, Remote Demonstrations And Presentations, Whiteboarding and Visual Selling, Storytelling, Evaluation Strategies, Answering Questions, The Trusted Advisor Sales Engineer, The Executive Connection, Doing The Math and Proving Business Value, The New SE: Getting Started, Creating Your Personal Brand, Selling With And Through Partners, Competitive Tactics, Using The CRM System, Compensation (Show Me The Money), Moving Into Sales, Career Progression, Becoming An Effective Subject Matter Expert/SE Specialist, The Hiring And Interview Process, Time Management For The Sales Engineer, Managing Yourself By The Metrics, and Final Words.

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