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Circuits Fundamentals of Applied Electromagnetics Solutions Manual Electromagnetics for Engineers Circuits Circuit Analysis and Design Fundamentals of Applied Electromagnetics Fundamentals of Applied Electromagnetics Electromagnetics for Engineers Image Processing for Engineers Signals and Systems Electromagnetics for Engineers Engineering Signals and Systems Electromagnetics for Engineers Electromagnetics for Engineers(CD1□□□)(Paperback)(CD1□□□)(Paperback) Mathematical and Physical Modelling of Microwave Scattering and Polarimetric Remote Sensing Comprehensive Remote Sensing Microwave Radar and Radiometric Remote Sensing Radar Remote Sensing for Crop Biophysical Parameter Estimation Encyclopedia of Snow, Ice and Glaciers Computational Electronics Chemo-Mechanical Coupling in Clays: From Nano-scale to Engineering Applications Advanced Remote Sensing Remote Sensing and Global Climate Change Advanced Engineering Electromagnetics Electromagnetic Waves Theory of Microwave Remote Sensing Fundamentals of Electromagnetics with MATLAB The State of the Art of Modeling Millimeter-wave Remote Sensing of the Environment Introduction to Microwave Remote Sensing Introduction to Probability for Data Science Passive Microwave Remote Sensing of Land--Atmosphere Interactions Signal Processing and Linear Systems Steel Design Principles of Synthetic Aperture Radar Imaging Lunar Sourcebook Modern Electromagnetic Scattering Theory with Applications Energy Harvesting for Autonomous Systems Microelectronics Radio Science

Introduction to Microwave Remote Sensing offers an extensive overview of this versatile and extremely precise technology for technically oriented undergraduates and graduate students. This textbook emphasizes an important shift in conceptualization and directs it toward students with prior knowledge of optical remote sensing: the author dispels any linkage between microwave and optical remote sensing. Instead, he constructs the concept of microwave remote sensing by comparing it to the process of audio perception, explaining the workings of the ear as a metaphor for microwave instrumentation. This volume takes an “application-driven” approach. Instead of describing the technology and then its

uses, this textbook justifies the need for measurement then explains how microwave technology addresses this need. Following a brief summary of the field and a history of the use of microwaves, the book explores the physical properties of microwaves and the polarimetric properties of electromagnetic waves. It examines the interaction of microwaves with matter, analyzes passive atmospheric and passive surface measurements, and describes the operation of altimeters and scatterometers. The textbook concludes by explaining how high resolution images are created using radars, and how techniques of interferometry can be applied to both passive and active sensors. CD-ROM contains: Demonstration exercises -- Complete solutions -- Problem statements. Principles of Synthetic Aperture Radar Imaging: A System Simulation Approach demonstrates the use of image simulation for SAR. It covers the various applications of SAR (including feature extraction, target classification, and change detection), provides a complete understanding of SAR principles, and illustrates the complete chain of a SAR operation. The book places special emphasis on a ground-based SAR, but also explains space and air-borne systems. It contains chapters on signal speckle, radar-signal models, sensor-trajectory models, SAR-image focusing, platform-motion compensation, and microwave-scattering from random media. While discussing SAR image focusing and motion compensation, it presents processing algorithms and applications that feature extraction, target classification, and change detection. It also provides samples of simulation on various scenarios, and includes simulation flowcharts and results that are detailed throughout the book. Introducing SAR imaging from a systems point of view, the author: Considers the recent development of MIMO SAR technology Includes selected GPU implementation Provides a numerical analysis of system parameters (including platforms, sensor, and image focusing, and their influence) Explores wave-target interactions, signal transmission and reception, image formation, motion compensation Covers all platform motion compensation and error analysis, and their impact on final image radiometric and geometric quality Describes a ground-based SFMCW system Principles of Synthetic Aperture Radar Imaging: A System Simulation Approach is dedicated to the use, study, and development of SAR systems. The book focuses on image formation or focusing, treats platform motion and image focusing, and is suitable for students, radar engineers, and microwave remote sensing researchers. STEEL DESIGN covers the fundamentals of

structural steel design with an emphasis on the design of members and their connections, rather than the integrated design of buildings. The book is designed so that instructors can easily teach LRFD, ASD, or both, time-permitting. The application of fundamental principles is encouraged for design procedures as well as for practical design, but a theoretical approach is also provided to enhance student development. While the book is intended for junior-and senior-level engineering students, some of the later chapters can be used in graduate courses and practicing engineers will find this text to be an essential reference tool for reviewing current practices. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. For courses in Electromagnetics offered in Electrical Engineering departments and Applied Physics. Designed specifically for a one-semester EM course covering both statics and dynamics, the book uses a number of tools to facilitate understanding of EM concepts and to demonstrate their relevance to modern technology. Technology Briefs provide overviews of both fundamental and sophisticated technologies, including the basic operation of an electromagnet in magnetic recording, the invention of the laser, and how EM laws underlie the operation of many types of sensors, bar code readers, GPS, communication satellites, and X-Ray tomography, among others. A CD-ROM packed with video presentations and solved problems accompanies the text. Experts report the state of the art in the study of global climate change using remote sensing techniques. Topics covered include the principles of remote sensing, the management of data, data requirements in climatology, the principles of modelling, the input of data into models, and the application of remote sensing to the atmosphere, ice and snow, seas and land. The book is highly topical given the current great public and scientific awareness of possible man-made changes to the climate. It is essential reading for anyone new to the field, and invaluable as a reference work to those already working in it. "This text presents a comprehensive treatment of signal processing and linear systems suitable for undergraduate students in electrical engineering, It is based on Lathi's widely used book, Linear Systems and Signals, with additional applications to communications, controls, and filtering as well as new chapters on analog and digital filters and digital signal processing. This volume's organization is different from the earlier book. Here, the Laplace transform follows Fourier, rather than the reverse; continuous-time and discrete-time systems are treated

sequentially, rather than interwoven. Additionally, the text contains enough material in discrete-time systems to be used not only for a traditional course in signals and systems but also for an introductory course in digital signal processing. In Signal Processing and Linear Systems Lathi emphasizes the physical appreciation of concepts rather than the mere mathematical manipulation of symbols. Avoiding the tendency to treat engineering as a branch of applied mathematics, he uses mathematics not so much to prove an axiomatic theory as to enhance physical and intuitive understanding of concepts. Wherever possible, theoretical results are supported by carefully chosen examples and analogies, allowing students to intuitively discover meaning for themselves"-- The only work to date to collect data gathered during the American and Soviet missions in an accessible and complete reference of current scientific and technical information about the Moon. Recent advances in theory and observations using passive microwave remote sensing have highlighted the potential of spaceborne sensors for contributing to the required land surface measurements of soils, vegetation, snow cover and precipitation. Furthermore, the spatial resolution of passive microwave observations matches the special scales of large-scale models of land-atmosphere interactions both for data assimilation and validation. In order to stimulate and focus this research a workshop, sponsored by ESA and NASA, was organized to review the state-of-the-art in microwave radiometry related to land applications and to exchange ideas leading into new directions for future research. This volume contains the refereed papers from the aforementioned ESA/NASA workshop, which are arranged by topic, as well as the (edited) working group reports. Comprehensive Remote Sensing covers all aspects of the topic, with each volume edited by well-known scientists and contributed to by frontier researchers. It is a comprehensive resource that will benefit both students and researchers who want to further their understanding in this discipline. The field of remote sensing has quadrupled in size in the past two decades, and increasingly draws in individuals working in a diverse set of disciplines ranging from geographers, oceanographers, and meteorologists, to physicists and computer scientists. Researchers from a variety of backgrounds are now accessing remote sensing data, creating an urgent need for a one-stop reference work that can comprehensively document the development of remote sensing, from the basic principles, modeling and practical algorithms, to various applications. Fully

comprehensive coverage of this rapidly growing discipline, giving readers a detailed overview of all aspects of Remote Sensing principles and applications Contains 'Layered content', with each article beginning with the basics and then moving on to more complex concepts Ideal for advanced undergraduates and academic researchers Includes case studies that illustrate the practical application of remote sensing principles, further enhancing understanding

2-10.3 Multiple Reflection Method

This unique resource provides a detailed understanding of the options for harvesting energy from localized, renewable sources to supply power to autonomous wireless systems. You are introduced to a variety of types of autonomous system and wireless networks and discover the capabilities of existing battery-based solutions, RF solutions, and fuel cells. The book focuses on the most promising harvesting techniques, including solar, kinetic, and thermal energy. You also learn the implications of the energy harvesting techniques on the design of the power management electronics in a system. This in-depth reference discusses each energy harvesting approach in detail, comparing and contrasting its potential in the field. Radar technology is increasingly being used to monitor the environment. This monograph provides a review of polarimetric radar techniques for remote sensing. The first four chapters cover the basics of mathematical, statistical modelling as well as physical modelling based on radiowave scattering theory. The subsequent eight chapters summarize applications of polarimetric radar monitoring for various types of earth environments, including vegetation and oceans. The last two chapters provide a summary of Western as well as former Soviet Union knowledge and the outlook. This monograph is of value to students, scientists and engineers involved in remote sensing development and applications in particular for environmental monitoring. Balanis' second edition of *Advanced Engineering Electromagnetics* - a global best-seller for over 20 years - covers the advanced knowledge engineers involved in electromagnetic need to know, particularly as the topic relates to the fast-moving, continually evolving, and rapidly expanding field of wireless communications. The immense interest in wireless communications and the expected increase in wireless communications systems projects (antenna, microwave and wireless communication) points to an increase in the number of engineers needed to specialize in this field. In addition, the *Instructor Book Companion Site* contains a rich collection of multimedia resources for use with this text. Resources include:

Ready-made lecture notes in Power Point format for all the chapters. Forty-nine MATLAB® programs to compute, plot and animate some of the wave phenomena Nearly 600 end-of-chapter problems, that's an average of 40 problems per chapter (200 new problems; 50% more than in the first edition) A thoroughly updated Solutions Manual 2500 slides for Instructors are included.

"Designed for a course on image processing (IP) aimed at both graduate students as well as undergraduates in their senior year, in any field of engineering, this book starts with an overview in Chapter 1 of how imaging sensors--from cameras to radars to MRIs and CAT--form images, and then proceeds to cover a wide array of image processing topics. The IP topics include: image interpolation, magnification, thumbnails, and sharpening, edge detection, noise filtering, de-blurring of blurred images, supervised and unsupervised learning, and image segmentation, among many others. As a prelude to the chapters focused on image processing (Chapters 3-12), the book offers in Chapter 2 a review of 1-D signals and systems, borrowed from our 2018 book Signals and Systems: Theory and Applications, by Ulaby and Yagle."--Preface. Advanced Remote Sensing is an application-based reference that provides a single source of mathematical concepts necessary for remote sensing data gathering and assimilation. It presents state-of-the-art techniques for estimating land surface variables from a variety of data types, including optical sensors such as RADAR and LIDAR. Scientists in a number of different fields including geography, geology, atmospheric science, environmental science, planetary science and ecology will have access to critically-important data extraction techniques and their virtually unlimited applications. While rigorous enough for the most experienced of scientists, the techniques are well designed and integrated, making the book's content intuitive, clearly presented, and practical in its implementation. Comprehensive overview of various practical methods and algorithms Detailed description of the principles and procedures of the state-of-the-art algorithms Real-world case studies open several chapters More than 500 full-color figures and tables Edited by top remote sensing experts with contributions from authors across the geosciences The earth's cryosphere, which includes snow, glaciers, ice caps, ice sheets, ice shelves, sea ice, river and lake ice, and permafrost, contains about 75% of the earth's fresh water. It exists at almost all latitudes, from the tropics to the poles, and plays a vital role in controlling the global climate system. It also provides direct visible evidence of the effect of

climate change, and, therefore, requires proper understanding of its complex dynamics. This encyclopedia mainly focuses on the various aspects of snow, ice and glaciers, but also covers other cryospheric branches, and provides up-to-date information and basic concepts on relevant topics. It includes alphabetically arranged and professionally written, comprehensive and authoritative academic articles by well-known international experts in individual fields. The encyclopedia contains a broad spectrum of topics, ranging from the atmospheric processes responsible for snow formation; transformation of snow to ice and changes in their properties; classification of ice and glaciers and their worldwide distribution; glaciation and ice ages; glacier dynamics; glacier surface and subsurface characteristics; geomorphic processes and landscape formation; hydrology and sedimentary systems; permafrost degradation; hazards caused by cryospheric changes; and trends of glacier retreat on the global scale along with the impact of climate change. This book can serve as a source of reference at the undergraduate and graduate level and help to better understand snow, ice and glaciers. It will also be an indispensable tool containing specialized literature for geologists, geographers, climatologists, hydrologists, and water resources engineers; as well as for those who are engaged in the practice of agricultural and civil engineering, earth sciences, environmental sciences and engineering, ecosystem management, and other relevant subjects. This book is dedicated to various aspects of electromagnetic wave theory and its applications in science and technology. The covered topics include the fundamental physics of electromagnetic waves, theory of electromagnetic wave propagation and scattering, methods of computational analysis, material characterization, electromagnetic properties of plasma, analysis and applications of periodic structures and waveguide components, and finally, the biological effects and medical applications of electromagnetic fields. This junior level electronics text provides a foundation for analyzing and designing analog and digital electronics throughout the book. Extensive pedagogical features including numerous design examples, problem solving technique sections, Test Your Understanding questions, and chapter checkpoints lend to this classic text. The author, Don Neamen, has many years experience as an Engineering Educator. His experience shines through each chapter of the book, rich with realistic examples and practical rules of thumb. The Third Edition continues to offer the same hallmark features that made the

previous editions such a success. Extensive Pedagogy: A short introduction at the beginning of each chapter links the new chapter to the material presented in previous chapters. The objectives of the chapter are then presented in the Preview section and then are listed in bullet form for easy reference. Test Your Understanding Exercise Problems with provided answers have all been updated. Design Applications are included at the end of chapters. A specific electronic design related to that chapter is presented. The various stages in the design of an electronic thermometer are explained throughout the text. Specific Design Problems and Examples are highlighted throughout as well. Large computational resources are of ever increasing importance for the simulation of semiconductor processes, devices and integrated circuits. The Workshop on Computational Electronics was intended to be a forum for the discussion of the state-of-the-art of device simulation. Three major research areas were covered: conventional simulations, based on the drift-diffusion and the hydrodynamic models; Monte Carlo methods and other techniques for the solution of the Boltzmann transport equation; and computational approaches to quantum transport which are relevant to novel devices based on quantum interference and resonant tunneling phenomena. Our goal was to bring together researchers from various disciplines that contribute to the advancement of device simulation. These include Computer Science, Electrical Engineering, Applied Physics and Applied Mathematics. The success of this multidisciplinary formula was proven by numerous interactions which took place at the Workshop and during the following three-day Short Course on Computational Electronics. The format of the course, including a number of tutorial lectures, and the large attendance of graduate students, stimulated many discussions and has proven to us once more the importance of cross-fertilization between the different disciplines. Clay behaviour is affected by coupled mechanical and chemical processes occurring in them at various scales. The peculiar chemical and electro-chemical properties of clays are the source of many undesired effects. These papers provide insight into the variables controlling clay behaviour. "Probability is one of the most interesting subjects in electrical engineering and computer science. It bridges our favorite engineering principles to the practical reality, a world that is full of uncertainty. However, because probability is such a mature subject, the undergraduate textbooks alone might fill several rows of shelves in a library. When the literature is so rich, the challenge becomes how one can pierce

through to the insight while diving into the details. For example, many of you have used a normal random variable before, but have you ever wondered where the 'bell shape' comes from? Every probability class will teach you about flipping a coin, but how can 'flipping a coin' ever be useful in machine learning today? Data scientists use the Poisson random variables to model the internet traffic, but where does the gorgeous Poisson equation come from? This book is designed to fill these gaps with knowledge that is essential to all data science students." -- Preface. This book presents a timely investigation of radar remote sensing observations for agricultural crop monitoring and advancements of research techniques and their applicability for crop biophysical parameter estimation. It introduces theoretical background of radar scattering from vegetation volume and semi-empirical modelling approaches that are the foundation for biophysical parameter inversion. The contents will help readers explore the state-of-the-art crop monitoring and biophysical parameter estimation using approaches radar remote sensing. It is useful guide for academicians, practitioners and policymakers. Includes textbook CD-ROM "Engineering Signals and Systems Textbook Resources" CD-ROM contains: 77 interactive modules keyed to text, 85 demonstration exercises, solutions of selected end-of-chapter problems and copies of all figures in the book. Accompanying CD-ROM contains a MATLAB tutorial. The first single-volume guide to the theoretical underpinnings and practical applications of microwave remote sensing, combining detailed coverage of mathematical derivations relevant to propagation and scattering in physical media with physical examples and practical applications to microwave theory. Covers scattering and emission by layered media, radiative transfer theory, solutions to radiative transfer equations with applications to remote sensing, analytic wave theory for scattering by layered random media, and scattering by random discrete scatterers. "This is a signals and systems textbook with a difference: Engineering applications of signals and systems are integrated into the presentation as equal partners with concepts and mathematical models, instead of just presenting the concepts and models and leaving the student to wonder how it all relates to engineering."--Preface. This self-contained book gives fundamental knowledge about scattering and diffraction of electromagnetic waves and fills the gap between general electromagnetic theory courses and collections of engineering formulas. The book is a tutorial for advanced students learning the mathematics and

physics of electromagnetic scattering and curious to know how engineering concepts and techniques relate to the foundations of electromagnetics KEY BENEFIT Widely acclaimed both in the U.S. and abroad, this reader-friendly yet authoritative volume bridges the gap between circuits and new electromagnetics material. Ulaby begins coverage with transmission lines, leading readers from familiar concepts into more advanced topics and applications. KEY TOPICS Introduction: Waves and Phasors; Transmission Lines; Vector Analysis; Electrostatics; Magnetostatics; Maxwell's Equations for Time-Varying Fields; Plane-Wave Propagation; Reflection, Transmission, and Waveguides; Radiation and Antennas; Satellite Communication Systems and Radar Sensors. MARKET A useful reference for engineers.

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