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***IEEE Technology Update Series***

1996

this set contains two volumes in the iee technology update series neural networks theory technology and applications and neural networks applications

**Complete PCB Design Using OrCAD Capture and PCB Editor**

2019-06-20

complete pcb design using orcad capture and pcb editor second edition provides practical instruction on how to use the orcad design suite to design and manufacture printed circuit boards chapters cover how to design a pcb using orcad capture and orcad layout adding pspice simulation capabilities to a design how to develop custom schematic parts how to create footprints and pspice models and how to perform documentation simulation and board fabrication from the same schematic design this book is suitable for both beginners and experienced designers providing basic principles and the program s full capabilities for optimizing designs presents a fully updated edition on orcad capture version 17 2 combines the theoretical and practical parts of pcb design includes real life design examples that show how and why designs work providing a comprehensive toolset for understanding orcad software provides the exact order in which a circuit and pcb are designed introduces the ipc jedec and iee standards relating to pcb design

***The Multilevel Fast Multipole Algorithm (MLFMA) for Solving Large-Scale Computational Electromagnetics Problems***

2014-04-22

the multilevel fast multipole algorithm mlfma for solving large scale computational electromagnetic problems provides a detailed and instructional overview of implementing mlfma the book presents a comprehensive treatment of the mlfma algorithm including basic linear algebra concepts recent developments on the parallel computation and a number of application examples covers solutions of electromagnetic problems involving dielectric objects and perfectly conducting objects discusses applications including scattering from airborne targets scattering from red blood cells radiation from antennas and arrays metamaterials etc is written by authors who have more than 25 years experience on the development and implementation of mlfma the book will be useful for post graduate students researchers and academics studying in the areas of computational electromagnetics numerical analysis and computer science and who would like to implement and develop rigorous simulation environments based on mlfma

**Engineering Technology and Applications**

2014-08-19

engineering technology and applications contains the contributions presented at the 2014 international conference on engineering technology and applications iceta 2014 tsingtao china 29 30 april 2014 the book is divided into three main topics civil and environmental engineering electrical and computer engineering mechanical engineering considerable attention is also paid to big data cloud computing neural network algorithms and social network services the book will be invaluable to professionals and academics in civil environmental electrical computer and mechanical engineering

## ***Complete PCB Design Using OrCad Capture and Layout***

2011-04-01

complete pcb design using orcad capture and layout provides instruction on how to use the orcad design suite to design and manufacture printed circuit boards the book is written for both students and practicing engineers who need a quick tutorial on how to use the software and who need in depth knowledge of the capabilities and limitations of the software package there are two goals the book aims to reach the primary goal is to show the reader how to design a pcb using orcad capture and orcad layout capture is used to build the schematic diagram of the circuit and layout is used to design the circuit board so that it can be manufactured the secondary goal is to show the reader how to add pspice simulation capabilities to the design and how to develop custom schematic parts footprints and pspice models often times separate designs are produced for documentation simulation and board fabrication this book shows how to perform all three functions from the same schematic design this approach saves time and money and ensures continuity between the design and the manufactured product information is presented in the exact order a circuit and pcb are designed straightforward realistic examples present the how and why the designs work providing a comprehensive toolset for understanding the orcad software introduction to the ipc jedec and ieee standards relating to pcb design full color interior and extensive illustrations allow readers to learn features of the product in the most realistic manner possible

## **Electrical Power Systems**

1995-03-09

this comprehensive textbook introduces electrical engineers to the most relevant concepts and techniques in electric power systems engineering today with an emphasis on practical motivations for choosing the best design and analysis approaches the author carefully integrates theory and application key features include more than 500 illustrations and diagrams clearly developed procedures and application examples important mathematical details coverage of both alternating and direct current an additional set of solved problems at the end of each chapter and an historical overview of the development of electric power systems this book will be useful to both power engineering students and professional power engineers

## **Model Predictive Control of Wind Energy Conversion Systems**

2016-11-23

model predictive control of wind energy conversion systems addresses the predictive control strategy that has emerged as a promising digital control tool within the field of power electronics variable speed motor drives and energy conversion systems the authors provide a comprehensive analysis on the model predictive control of power converters employed in a wide variety of variable speed wind energy conversion systems wecs the contents of this book includes an overview of wind energy system configurations power converters for variable speed wecs digital control techniques mpc modeling of power converters and wind generators for mpc design other topics include the mapping of continuous time models to discrete time models by various exact approximate and quasi exact discretization methods modeling and control of wind turbine grid side two level and multilevel voltage source converters the authors also focus on the mpc of several power converter configurations for full variable speed permanent magnet synchronous generator based wecs squirrel cage induction generator based wecs and semi variable speed doubly fed induction generator based wecs furthermore this book analyzes a wide variety of practical wecs illustrating important concepts with case studies simulations and experimental results provides a step by step design procedure for the development of predictive control schemes for various wecs configurations describes continuous and discrete time modeling of wind generators and power converters weighting factor selection discretization methods and extrapolation techniques presents useful material for other power electronic applications such as variable speed motor drives power quality conditioners electric vehicles photovoltaic energy systems distributed generation and high voltage direct current transmission explores s function builder programming in matlab environment to implement various mpc strategies through the

companion website reflecting the latest technologies in the field model predictive control of wind energy conversion systems is a valuable reference for academic researchers practicing engineers and other professionals it can also be used as a textbook for graduate level and advanced undergraduate courses

## ***Advanced Solutions in Power Systems***

2016

the first single volume resource for researchers in the field who previously had to depend on separate papers and conference records to attain a working knowledge of the subject brings together the field s diverse approaches into an integrated and comprehensive theory of pwm

## ***Pulse Width Modulation for Power Converters***

2003-10-03

praise for the exponential era the exponential era turns strategic planning from a stagnant limited application exercise to an active thoughtful process that can yield benefits for all companies and executives every company leader can find a gem in the exponential era to apply to their business big or small michael splinter chairman of the board nasdaq and retired chairman and chief executive officer applied materials i count this among the very best business books i have read the authors have managed to synthesize a vast array of thinking and methodologies and deployed them in a practical and easily understood planning process spx that addresses today s exponential pace of change james b stake former executive vice president enterprise services 3m company and chairman ativa medical corporation the exponential era is an essential read for our times john puckett owner of punch pizza and co founder of caribou coffee the exponential era does a great job of not only describing exponential technologies but how they likely converge to transform our world frank diana managing partner futurist tata consultancy services the exponential era is a must read for business leaders entrepreneurs and virtually anyone navigating our highly complex and rapidly changing world general ret 4 star joseph l votel president and ceo business executives for national security bens

## **The Exponential Era**

2021-01-07

reinforcement and systemic machine learning for decision making there are always difficulties in making machines that learn from experience complete information is not always available or it becomes available in bits and pieces over a period of time with respect to systemic learning there is a need to understand the impact of decisions and actions on a system over that period of time this book takes a holistic approach to addressing that need and presents a new paradigm creating new learning applications and ultimately more intelligent machines the first book of its kind in this new and growing field reinforcement and systemic machine learning for decision making focuses on the specialized research area of machine learning and systemic machine learning it addresses reinforcement learning and its applications incremental machine learning repetitive failure correction mechanisms and multiperspective decision making chapters include introduction to reinforcement and systemic machine learning fundamentals of whole system systemic and multiperspective machine learning systemic machine learning and model inference and information integration adaptive learning incremental learning and knowledge representation knowledge augmentation a machine learning perspective building a learning system with the potential of this paradigm to become one of the more utilized in its field professionals in the area of machine and systemic learning will find this book to be a valuable resource

## **Reinforcement and Systemic Machine Learning for Decision Making**

2012-07-11

this book includes selected peer reviewed papers presented at the international conference on computing and communication networks iccn 2021 held at manchester metropolitan university united kingdom during 19 20 november 2021 the book covers topics of network and computing technologies artificial intelligence and machine learning security and privacy communication systems cyber physical systems data analytics cyber security for industry 4 0 and smart and sustainable environmental systems

## **Proceedings of International Conference on Computing and Communication Networks**

2022-07-08

do you want to design a wireless transmitter or receiver for hand held telephones have you wondered why the printed circuit wires on high frequency circuits don t always run in a straight line this valuable text will answer all of your questions regarding component parasitics and circuit characterization for rf microwave amplifier oscillator and filter circuit design and analysis you will understand why capacitors act as inductors and vice versa and why amplifiers work like oscillators while oscillators for local area networks work more like local area heaters application of the information in introduction to microwave circuits will reduce design cycle time and costs markedly increasing the probability of first time success in printed circuit or monolithic microwave integrated circuit mmic design several approaches are taken into consideration such as the effects of currents on the ground plane bypass and coupling capacitors and nonlinear effects in linear circuits featured topics include incorporation of component parasitics in the design cycle closed form solution to oscillator design odd mode stability analysis pin diode analysis for high power switching applications an integrated design example of a 1 25 ghz amplifier oscillator and filter printed circuit is also included which could be useful in printed circuit board designs from tens of megahertz to tens of gigahertz introduction to microwave circuits provides the tools necessary to analyze or synthesize microwave circuits this text is an essential reference for undergraduate students microwave engineers and administrators also it will assist experienced designers in other fields to meet the current rapid expansion of communication system applications and work effectively in microwave circuit design about the author robert j weber began his prolific career in the solid state research laboratory at the collins radio company later a part of rockwell international for 25 years he worked on advanced development and applied research in the one to ten gigahertz frequency range and received several distinguished awards for his valuable contributions to the field dr weber is involved in ongoing experimental research in integrating microwave circuits with other devices such as mems chemical sensors and electro optics also he teaches microwave circuit design and fiber optics communications at the department of electrical and computer engineering iowa state university dr weber is an ieee fellow sponsored by ieee microwave theory and techniques society

## **Introduction to Microwave Circuits**

2001-01-23

this book gathers selected peer reviewed papers from the 15th world congress on engineering asset management wceam which was hosted by the federal university of mato grosso do sul campo grande brazil from 15 18 august 2021 this book covers a wide range of topics in engineering asset management including strategy and standards sustainability and resiliency servitisation and industry 4 0 business models asset information systems and asset management decision making the breadth and depth of these state of the art comprehensive proceedings make them an excellent resource for asset management practitioners researchers and academics as well as undergraduate and postgraduate students

## ***15th WCEAM Proceedings***

2022-03-24

this updated edition provides detailed information on the amendments to the standard including ieee 802 15 4a ieee 802 15 4c ieee 802 15 4d ieee 802 15 4e ieee 802 15 4f and ieee 802 15 4g as well as an update on the zigbee alliance this book extends the previous editions by adding a new section centered on providing a complete presentation of the wireless hART protocol divided into four parts the first part of the book presents an overview of the low rate wireless personal area technology and ieee 802 15 4 not only a technical introduction this part of the book is valuable to marketing and business professionals it can help them understand the technology and vision behind the standards conception so they can more effectively plan marketing and business strategies the second part of the text concentrates on the technical features and components of the standard while the third part focuses on implementation and system design considerations wireless hART is covered in the fourth part providing details that demonstrate how a high performance and reliable industrial standard can be built on the ieee 802 15 4 technology

## ***Low-Rate Wireless Personal Area Networks***

2011-03-08

introducing a new edition of the popular reference on machine analysis now in a fully revised and expanded edition this widely used reference on machine analysis boasts many changes designed to address the varied needs of engineers in the electric machinery electric drives and electric power industries the authors draw on their own extensive research efforts bringing all topics up to date and outlining a variety of new approaches they have developed over the past decade focusing on reference frame theory that has been at the core of this work since the first edition this volume goes a step further introducing new material relevant to machine design along with numerous techniques for making the derivation of equations more direct and easy to use coverage includes completely new chapters on winding functions and machine design that add a significant dimension not found in any other text a new formulation of machine equations for improving analysis and modeling of machines coupled to power electronic circuits simplified techniques throughout from the derivation of torque equations and synchronous machine analysis to the analysis of unbalanced operation a unique generalized approach to machine parameters identification a first rate resource for engineers wishing to master cutting edge techniques for machine analysis analysis of electric machinery and drive systems is also a highly useful guide for students in the field

## **Analysis of Electric Machinery and Drive Systems**

2013-06-17

an introduction to multivectors dyadics and differential forms for electrical engineers while physicists have long applied differential forms to various areas of theoretical analysis dyadic algebra is also the most natural language for expressing electromagnetic phenomena mathematically george deschamps pioneered the application of differential forms to electrical engineering but never completed his work now ismo v lindell an internationally recognized authority on differential forms provides a clear and practical introduction to replacing classical gibbsian vector calculus with the mathematical formalism of differential forms in differential forms in electromagnetics lindell simplifies the notation and adds memory aids in order to ease the reader's leap from gibbsian analysis to differential forms and provides the algebraic tools corresponding to the dyadics of gibbsian analysis that have long been missing from the formalism he introduces the reader to basic em theory and wave equations for the electromagnetic two forms discusses the derivation of useful identities and explains novel ways of treating problems in general linear bi anisotropic media clearly written and devoid of unnecessary mathematical jargon differential forms in electromagnetics helps engineers master an area of intense interest for anyone involved in research on metamaterials

## Differential Forms in Electromagnetics

2004-04-27

explore the algorithms and numerical methods used to compute electromagnetic fields in multi layered media in theory and computation of electromagnetic fields in layered media two distinguished electrical engineering researchers deliver a detailed and up to date overview of the theory and numerical methods used to determine electromagnetic fields in layered media the book begins with an introduction to maxwell s equations the fundamentals of electromagnetic theory and concepts and definitions relating to green s function it then moves on to solve canonical problems in vertical and horizontal dipole radiation describe method of moments schemes discuss integral equations governing electromagnetic fields and explains the michalski zheng theory of mixed potential green s function representation in multi layered media chapters on the evaluation of sommerfeld integrals procedures for far field evaluation and the theory and application of hierarchical matrices are also included along with a thorough introduction to free space green s functions including the delta function model for point charge and dipole current comprehensive explorations of the traditional form of layered medium green s function in three dimensions practical discussions of electro quasi static and magneto quasi static fields in layered media including electrostatic fields in two and three dimensions in depth examinations of the rational function fitting method including direct spectra fitting with vectfit algorithms perfect for scholars and students of electromagnetic analysis in layered media theory and computation of electromagnetic fields in layered media will also earn a place in the libraries of cad industry engineers and software developers working in the area of computational electromagnetics

## Theory and Computation of Electromagnetic Fields in Layered Media

2024-04-30

this is the first comprehensive treatment of conformal antenna arrays from an engineering perspective while providing a thorough foundation in theory the authors of this publication provide a wealth of hands on instruction for practical analysis and design of conformal antenna arrays thus you get the knowledge you need alongside the practical know how to design antennas that are integrated into such structures aircrafts or skyscrapers

## Conformal Array Antenna Theory and Design

2006-02-10

a comprehensive introduction to cdma theory and application code division multiple access cdma communication is rapidly replacing time and frequency division methods as the cornerstone of wireless communication and mobile radio theory of code division multiple access communication provides a lucid introduction and overview of cdma concepts and methods for both the professional and the advanced student emphasizing the role cdma has played in the development of wireless communication and cellular mobile radio systems the author leads you through the basic concepts of mobile radio systems and considers the different principles of multiple access time division frequency division and code division he then analyzes three major cdma systems direct sequence ds cdma systems frequency hopped fh cdma systems and pulse position hopped pph cdma systems other topics covered include spread spectrum ss technology forward error control coding cdma communication on fading channels pseudorandom signals information theory in relation to cdma communication cdma cellular networks complete with useful appendices providing analyses of the moments of cdma system decision statistics theory of code division multiple access communication is a ready reference for every engineer seeking an understanding of the history and concepts of this key communications technology

## ***Theory of Code Division Multiple Access Communication***

2004-05-10

the classic reference for power system engineers power system stability volumes i ii iii is a classic reference for power system engineers now reissued together as a set volume i elements of stability calculations covers the elements of stability principal affecting factors and applications on power systems volume ii power circuit breakers and protective relays features in depth information on organization materials actions and conditions as they relate to power system stability volume iii synchronous machines details the more advanced calculations required in special circumstances that demand a higher level of accuracy than the simplified calculations presented in volume i can provide

## ***Power System Stability***

1995-03-13

advances in electromagnetics empowered by artificial intelligence and deep learning authoritative reference on the state of the art in the field with additional coverage of important foundational concepts advances in electromagnetics empowered by artificial intelligence and deep learning presents cutting edge research advances in the rapidly growing areas in optical and rf electromagnetic device modeling simulation and inverse design the text provides a comprehensive treatment of the field on subjects ranging from fundamental theoretical principles and new technological developments to state of the art device design as well as examples encompassing a wide range of related sub areas the content of the book covers all dielectric and metallodielectric optical metasurface deep learning accelerated inverse design deep neural networks for inverse scattering applications of deep learning for advanced antenna design and other related topics to aid in reader comprehension each chapter contains 10 15 illustrations including prototype photos line graphs and electric field plots contributed to by leading research groups in the field sample topics covered in advances in electromagnetics empowered by artificial intelligence and deep learning include optical and photonic design including generative machine learning for photonic design and inverse design of electromagnetic systems rf and antenna design including artificial neural networks for parametric electromagnetic modeling and optimization and analysis of uniform and non uniform antenna arrays inverse scattering target classification and other applications including deep learning for high contrast inverse scattering of electrically large structures advances in electromagnetics empowered by artificial intelligence and deep learning is a must have resource on the topic for university faculty graduate students and engineers within the fields of electromagnetics wireless communications antenna rf design and photonics as well as researchers at large defense contractors and government laboratories

## ***Advances in Electromagnetics Empowered by Artificial Intelligence and Deep Learning***

2023-08-03

in order to precisely model real life systems or man made devices both nonlinear and dynamic properties need to be taken into account the generic black box model based on volterra and wiener series is capable of representing fairly complicated nonlinear and dynamic interactions however the resulting identification algorithms are impractical mainly due to their computational complexity one of the alternatives offering fast identification algorithms is the block oriented approach in which systems of relatively simple structures are considered the book provides nonparametric identification algorithms designed for such systems together with the description of their asymptotic and computational properties

## ***Nonlinear System Identification by Haar Wavelets***

2012-10-12



discover the analytical foundations of electric machine power electronics electric drives and electric power systems in introduction to the analysis of electromechanical systems an accomplished team of engineers delivers an accessible and robust analysis of fundamental topics in electrical systems and electrical machine modeling oriented to their control with power converters the book begins with an introduction to the electromagnetic variables in rotatory and stationary reference frames before moving onto descriptions of electric machines the authors discuss direct current round rotor permanent magnet alternating current and induction machines as well as brushless direct current and induction motor drives synchronous generators and various other aspects of electric power system engineering are covered as well showing readers how to describe the behavior of electromagnetic variables and how to approach their control with modern power converters introduction to the analysis of electromechanical systems presents analysis techniques at an introductory level and at sufficient detail to be useful as a prerequisite for higher level courses it also offers supplementary materials in the form of online animations and videos to illustrate the concepts contained within readers will also enjoy a thorough introduction to basic system analysis including phasor analysis power calculations elementary magnetic circuits stationary coupled circuits and two and three phase systems comprehensive explorations of the basics of electric machine analysis and power electronics including switching circuit fundamentals conversion and electromagnetic force and torque practical discussions of power systems including three phase transformer connections synchronous generators reactive power and power factor correction and discussions of transient stability perfect for researchers and industry professionals in the area of power and electric drives introduction to the analysis of electromechanical systems will also earn its place in the libraries of senior undergraduate and graduate students and professors in these fields

## ***Introduction to the Analysis of Electromechanical Systems***

2021-12-29

sensorless control of permanent magnet synchronous machine drives a comprehensive resource providing basic principles and state of the art developments in sensorless control technologies for permanent magnet synchronous machine drives sensorless control of permanent magnet synchronous machine drives highlights the global research achievements over the last three decades and the sensorless techniques developed by the authors and their colleagues and covers sensorless control techniques of permanent magnet machines discussing issues and solutions many worked application examples are included to aid in practical understanding of concepts written by pioneering authors in the field sensorless control of permanent magnet synchronous machine drives covers topics such as permanent magnet brushless ac and dc drives single three phase dual three phase and open winding machines modern control theory based sensorless methods covering model reference adaptive system sliding mode observer extended kalman filter and model predictive control flux linkage and back emf based methods for non salient machines and active flux linkage and extended back emf methods for salient machines pulsating and rotating high frequency sinusoidal and square wave signal injection methods with current or voltage response at different reference frames and selection of amplitude and frequency for injection signal sensorless control techniques based on detecting third harmonic or zero crossings of back emf waveforms parasitic effects in fundamental and high frequency models impacts on position estimation and compensation schemes covering cross coupling magnetic saturation load effect machine saliency and multiple saliencies describing basic principles examples challenges and practical solutions sensorless control of permanent magnet synchronous machine drives is a highly comprehensive resource on the subject for professionals working on electrical machines and drives particularly permanent magnet machines and researchers working on electric vehicles wind power generators household appliances and industrial automation

## **Sensorless Control of Permanent Magnet Synchronous Machine Drives**

2023-11-14

a comprehensive review of the theory and practice for designing operating and optimizing electric distribution systems revised and updated now in its second edition electric distribution systems has been revised and updated and continues to provide a two tiered approach for designing installing and managing effective and efficient electric distribution systems with an emphasis on both the practical and theoretical approaches the text is a guide to the

underlying theory and concepts and provides a resource for applying that knowledge to problem solving the authors noted experts in the field explain the analytical tools and techniques essential for designing and operating electric distribution systems in addition the authors reinforce the theories and practical information presented with real world examples as well as hundreds of clear illustrations and photos this essential resource contains the information needed to design electric distribution systems that meet the requirements of specific loads cities and zones the authors also show how to recognize and quickly respond to problems that may occur during system operations as well as revealing how to improve the performance of electric distribution systems with effective system automation and monitoring this updated edition contains new information about recent developments in the field particularly in regard to renewable energy generation clarifies the perspective of various aspects relating to protection schemes and accompanying equipment includes illustrative descriptions of a variety of distributed energy sources and their integration with distribution systems explains the intermittent nature of renewable energy sources various types of energy storage systems and the role they play to improve power quality stability and reliability written for engineers in electric utilities regulators and consultants working with electric distribution systems planning and projects the second edition of electric distribution systems offers an updated text to both the theoretical underpinnings and practical applications of electrical distribution systems

## ***Electric Distribution Systems***

2018-11-20

the has revolutionized the way we seek information on all aspects of education entertainment business health and so on the has evolved into a publishing medium global electronic market and increasingly a platform for conducting electronic commerce a part of this success can be attributed to the tremendous advances made in the artificial intelligence field the popularity of the has opened many opportunities to develop smart based systems using artificial intelligence techniques there exist numerous technology and applications that can benefit with the application of artificial intelligence techniques it is not possible to cover them all in one book with a required degree of quality depth and width we present this book to discuss some important developments by using artificial intelligence techniques in the areas of personalisation semantic and services the primary readers of this book are undergraduate postgraduate students researchers and practitioners in information technology and computer science related areas the success of this book is largely due to the collective efforts of a great team consisting of authors and reviewers we are grateful to them for their vision and wonderful support the final quality of selected papers reflects their efforts finally we would like to thank the queensland university of technology brisbane australia and university of south australia adelaide australia for providing us the resources and time to undertake this task we extend our sincere thanks to scientific publishing services pvt ltd for the editorial support

## **Evolution of the Web in Artificial Intelligence Environments**

2008-09-08

an important guide that reviews the basics of magnetic biosensor modeling and simulation magnetic sensors for biomedical applications offers a comprehensive review of magnetic biosensor modelling and simulation the authors noted experts on the topic explore the model s strengths and weaknesses and discuss the competencies of different modelling software including homemade and commercial for example multi physics modelling software the section on sensor materials examines promising materials whose properties have been used for sensing action and predicts future smart materials that have the potential for sensing application next the authors present classifications of sensors that are divided into different sub types they describe their working and highlight important applications that reveal the benefits and drawbacks of relevant designs the book also contains information on the most recent developments in the field of each sensor type this important book provides an even treatment of the major foundations of magnetic biosensors presents problem solution methods such as analytical and numerical explains how solution methods complement each other and offers information on their materials design computer aided modelling and simulation optimization and device fabrication describes modeling work challenges and solutions written for students in electrical and electronics engineering physics chemistry biomedical engineering and biology magnetic sensors for

biomedical applications offers a guide to the principles of biomagnetic sensors recent developments and reveals the impact of sensor modelling and simulation on magnetic sensors

## **Magnetic Sensors for Biomedical Applications**

2019-12-24

professor jean van bladel an eminent researcher and educator in fundamental electromagnetic theory and its application in electrical engineering has updated and expanded his definitive text and reference on electromagnetic fields to twice its original content this new edition incorporates the latest methods theory formulations and applications that relate to today s technologies with an emphasis on basic principles and a focus on electromagnetic formulation and analysis electromagnetic fields second edition includes detailed discussions of electrostatic fields potential theory propagation in waveguides and unbounded space scattering by obstacles penetration through apertures and field behavior at high and low frequencies

## **Electromagnetic Fields**

2007-06-04

proposes a new paradigm to investigate an individual s cognitive deliberation in dynamic human machine interactions today intelligent machines enable people to interact remotely with friends family romantic partners colleagues competitors organizations and others virtual reality vr augmented reality ar artificial intelligence ai mobile social media and other technologies have been driving these interactions to an unprecedented level as the complexity in system control and management with human participants increases engineers are facing challenges that arise from the uncertainty of operators or users parallel population and parallel human a cyber physical social approach presents systemic solutions for modeling analysis computation and management of individuals cognition and decision making in human participated systems such as the metaverse with a virtual real behavioral approach that seeks to actively prescribe user behavior through cognitive and dynamic learning the authors present a parallel population human model for optimal prescriptive control and management of complex systems that leverages recent advances in artificial intelligence throughout the book the authors address basic theory and methodology for modeling describe various implementation techniques highlight potential acceleration technologies discuss application cases from different fields and more in addition the text considers how an individual s behavior is formed and how to prescribe their behavioral modes describes agent based computation for complex social systems based on a synthetic population from realistic individual groups proposes a universal algorithm applicable to a wide range of social organization types extends traditional cognitive modeling by utilizing a dynamic approach to investigate cognitive deliberation in highly time variant tasks presents a new method that can be used for both large scale social systems and real time human machine interactions without extensive experiments for modeling parallel population and parallel human a cyber physical social approach is a must read for researchers engineers scientists professionals and graduate students who work on systems engineering human machine interaction cognitive computing and artificial intelligence

## ***Parallel Population and Parallel Human Modelling, Analysis, and Computation***

2023-07-25

this invaluable book provides a comprehensive framework for the formulation and solution of numerous problems involving the radiation reception propagation and scattering of electromagnetic and acoustic waves filled with original derivations and theorems it includes the first rigorous development of plane wave expansions for time domain electromagnetic and acoustic fields for the past 35 years near field measurement techniques have been confined to the frequency domain now with the publication of this book probe corrected near field measurement techniques have been extended to ultra wide band short pulse transmitting and receiving antennas and transducers by combining unencumbered straightforward derivations with in depth

expositions of prerequisite material the authors have created an invaluable resource for research scientists and engineers in electromagnetics and acoustics and a definitive reference on plane wave expansions and near field measurements featured topics include an introduction to the basic electromagnetic and acoustic field equations a rigorous development of time domain and frequency domain plane wave representations the formulation of time domain frequency domain and static planar near field measurement techniques with and without probe correction sampling theorems and computation schemes for time domain and frequency domain fields analytic signal formulas that simplify the formulation and analysis of transient fields wave phenomena such as electromagnetic missiles encountered only in the time domain definitive force and power relations for electromagnetic and acoustic fields and sources sponsored by ieee antennas and propagation society

## **Plane-Wave Theory of Time-Domain Fields**

1999-06-10

time harmonic electromagnetic fields a classic reissue in the ieee press series on electromagnetic wave theory donald g dudley series editor when i begin a new research project i clear my desk and put away all texts and reference books invariably harrington s book is the first book to find its way back to my desk my copy is so worn that it is falling apart dr kendall f casey sri in the opinion of our faculty there is no other book available that serves as well as professor harrington s does as an introduction to advanced electromagnetic theory and to classic solution methods in electromagnetics professor chalmers m butler clemson university first published in 1961 roger harrington s time harmonic electromagnetic fields is one of the most significant works in electromagnetic theory and applications over the past forty years it proved to be a key resource for students professors researchers and engineers who require a comprehensive in depth treatment of the subject now ieee is reissuing the classic in response to requests from our many members who found it an invaluable textbook and an enduring reference for practicing engineers about the ieee press series on electromagnetic wave theory the ieee press series on electromagnetic wave theory offers outstanding coverage of the field it consists of new titles of contemporary interest as well as reissues and revisions of recognized classics by established authors and researchers the series emphasizes works of long term archival significance in electromagnetic waves and applications designed specifically for graduate students researchers and practicing engineers the series provides affordable volumes that explore and explain electromagnetic waves beyond the undergraduate level

## **Time-Harmonic Electromagnetic Fields**

2001-09-13

at a time when bulk power systems operate close to their design limits the restructuring of the electric power industry has created vulnerability to potential blackouts prompt and effective power system restoration is essential for the minimization of downtime and costs to the utility and its customers which mount rapidly after a system blackout power system restoration meets the complex challenges that arise from the dynamic capabilities of new technology in areas such as large scale system analysis communication and control data management artificial intelligence and allied disciplines it provides an up to date description of the restoration methodologies and implementation strategies practiced internationally the book opens with a general overview of the restoration process and then covers techniques used in restoration planning and training knowledge based systems as operational aids in restoration issues associated with hydro and thermal power plants high and extra high voltage transmission systems restoration of distribution systems power system restoration is essential reading for all power system planners and operating engineers in the power industry it is also a valuable reference for researchers practicing power engineers and engineering students sponsored by ieee power engineering society

## **Power System Restoration**

2000-06-22

capacitive sensors produce spectacular resolution of movement to one part in 10<sup>10</sup> meters and maintain exceptional long term stability in hostile environments they are increasingly used for a variety of jobs in consumer and industrial equipment including wall stud sensors keypads lamp dimmers micrometers calipers rotation encoders and more the most focused authoritative book available in the field capacitive sensors brings you complete information on the research design and production of capacitive sensors this all in one source provides detailed comprehensive coverage of key topics including underlying theory electrode configuration and practical circuits in addition you ll find reviews of a number of tested systems never before published capacitive sensors is a must have for product designers and mechanical and electrical engineers interested in using this fast developing technology to get top price and performance advantages

## **Capacitive Sensors**

1996-09-03

the book is based on the observation that communication is the central operation of discovery in all the sciences in its active mode we use it to interrogate the physical world sending appropriate signals and receiving nature s reply in the passive mode we receive nature s signals directly since we never know a priori what particular return signal will be forthcoming we must necessarily adopt a probabilistic model of communication this has developed over the approximately seventy years since its beginning into a statistical communication theory or sct here it is the set or ensemble of possible results which is meaningful from this ensemble we attempt to construct in the appropriate model format based on our understanding of the observed physical data and on the associated statistical mechanism analytically represented by suitable probability measures since its inception in the late 30 s of the last century and in particular subsequent to world war ii sct has grown into a major field of study as we have noted above sct is applicable to all branches of science the latter itself is inherently and ultimately probabilistic at all levels moreover in the natural world there is always a random background noise as well as an inherent a priori uncertainty in the presentation of deterministic observations i e those which are specifically obtained a posteriori the purpose of the book is to introduce non gaussian statistical communication theory and demonstrate how the theory improves probabilistic model the book was originally planed to include 24 chapters as seen in the table of preface dr middleton completed first 10 chapters prior to his passing in 2008 bibliography which represents remaining chapters are put together by the author s close colleagues drs vincent poor leon cohen and john anderson email pressbooks ieee org to request ch 10

## ***Non-Gaussian Statistical Communication Theory***

2012-05-11

graph database and graph computing for power system analysis understand a new way to model power systems with this comprehensive and practical guide graph databases have become one of the essential tools for managing large data systems their structure improves over traditional table based relational databases in that it reconciles more closely to the inherent physics of a power system enabling it to model the components and the network of a power system in an organic way the authors pioneering research has demonstrated the effectiveness and the potential of graph data management and graph computing to transform power system analysis graph database and graph computing for power system analysis presents a comprehensive and accessible introduction to this research and its emerging applications programs and applications conventionally modeled for traditional relational databases are reconceived here to incorporate graph computing the result is a detailed guide which demonstrates the utility and flexibility of this cutting edge technology the book s readers will also find design configurations for a graph based program to solve linear equations differential equations optimization problems and more detailed demonstrations of graph based topology analysis state estimation power flow analysis security constrained economic dispatch automatic generation control small signal stability transient stability and other concepts analysis and applications an authorial team with decades of experience in software design and power systems analysis graph database and graph computing for power system analysis is essential for researchers and academics in power systems analysis and energy related fields as well as for advanced graduate students looking to understand this particular set of technologies

## ***Graph Database and Graph Computing for Power System Analysis***

2023-10-17

the comprehensive guide for large turbo generator operation and maintenance the handbook of large turbo generator operation and maintenance is an expanded 3rd edition of the authors second edition of the same book this updated revision covers additional topics on generators and provides more depth on existing topics it is the ultimate resource for operators and inspectors of large utility and industrial generating facilities who deal with multiple units of disparate size origin and vintage the book is also an excellent learning tool for students consulting and design engineers it offers the complete scope of information regarding operation and maintenance of all types of turbine driven generators found in the world based on the authors ver eighty combined years of generating station and design work experience the information presented in the book is designed to inform the reader about actual machine operational problems and failure modes that occur in generating stations and other types of facilities readers will find very detailed coverage of design and construction of generators and auxiliary systems generator operation and control including interaction with the grid monitoring diagnostics and protection of turbo generators inspection practices for the stator rotor and auxiliary systems maintenance testing including electrical and non destructive examination ideas on maintenance strategies and life cycle management additional topics on uprating of generators and long term storage are also included the handbook of large turbo generator operation and maintenance comes packed with photos and graphs commonly used inspection forms and extensive references for each topic it is an indispensable reference for anyone involved in the design construction operation protection maintenance and troubleshooting of large generators in generating stations and industrial power facilities

## ***Handbook of Large Turbo-Generator Operation and Maintenance***

2018-08-07

multiscale modelling in biomedical engineering discover how multiscale modeling can enhance patient treatment and outcomes in multiscale modelling in biomedical engineering an accomplished team of biomedical professionals delivers a robust treatment of the foundation and background of a general computational methodology for multi scale modeling the authors demonstrate how this methodology can be applied to various fields of biomedicine with a particular focus on orthopedics and cardiovascular medicine the book begins with a description of the relationship between multiscale modeling and systems biology before moving on to proceed systematically upwards in hierarchical levels from the molecular to the cellular tissue and organ level it then examines multiscale modeling applications in specific functional areas like mechanotransduction musculoskeletal and cardiovascular systems multiscale modelling in biomedical engineering offers readers experiments and exercises to illustrate and implement the concepts contained within readers will also benefit from the inclusion of a thorough introduction to systems biology and multi scale modeling including a survey of various multi scale methods and approaches and analyses of their application in systems biology comprehensive explorations of biomedical imaging and nanoscale modeling at the molecular cell tissue and organ levels practical discussions of the mechanotransduction perspective including recent progress and likely future challenges in depth examinations of risk prediction in patients using big data analytics and data mining perfect for undergraduate and graduate students of bioengineering biomechanics biomedical engineering and medicine multiscale modelling in biomedical engineering will also earn a place in the libraries of industry professional and researchers seeking a one stop reference to the basic engineering principles of biological systems

## **Multiscale Modelling in Biomedical Engineering**

2023-06-07

this book comprises the refereed proceedings of the international conference aim ccpe 2012 held in bangalore india in april 2012 the papers presented were carefully reviewed and selected from numerous submissions and focus on the various aspects of research and development activities in computer science information technology computational engineering mobile communication control and instrumentation communication system power electronics

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and power engineering

## **Mobile Communication and Power Engineering**

2013-01-17

deterministic and stochastic modeling in computational electromagnetics help protect your network with this important reference work on cyber security deterministic computational models are those for which all inputs are precisely known whereas stochastic modeling reflects uncertainty or randomness in one or more of the data inputs many problems in computational engineering therefore require both deterministic and stochastic modeling to be used in parallel allowing for different degrees of confidence and incorporating datasets of different kinds in particular non intrusive stochastic methods can be easily combined with widely used deterministic approaches enabling this more robust form of data analysis to be applied to a range of computational challenges deterministic and stochastic modeling in computational electromagnetics provides a rare treatment of parallel deterministic stochastic computational modeling and its beneficial applications unlike other works of its kind which generally treat deterministic and stochastic modeling in isolation from one another it aims to demonstrate the usefulness of a combined approach and present particular use cases in which such an approach is clearly required it offers a non intrusive stochastic approach which can be incorporated with minimal effort into virtually all existing computational models readers will also find a range of specific examples demonstrating the efficiency of deterministic stochastic modeling computational examples of successful applications including ground penetrating radars gpr radiation from 5g systems transcranial magnetic and electric stimulation tms and tes and more introduction to fundamental principles in field theory to ground the discussion of computational modeling deterministic and stochastic modeling in computational electromagnetics is a valuable reference for researchers including graduate and undergraduate students in computational electromagnetics as well as to multidisciplinary researchers engineers physicists and mathematicians

## **Deterministic and Stochastic Modeling in Computational Electromagnetics**

2023-12-07

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