

Design And Optimization Of Passive Uhf Rfid Systems 1st Edition

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MARIANA ASHTYN

Harmony Search Algorithms for Structural Design Optimization John Wiley & Sons

A typical engineering task during the development of any system is, among others, to improve its performance in terms of cost and response. Improvements can be achieved either by simply using design rules based on the experience or in an automated way by using optimization methods that lead to optimum designs. Design Optimization of Active and Passive Structural Control Systems includes Earthquake Engineering and Tuned Mass Damper research topics into a volume taking advantage of the connecting link between them, which is optimization. This is a publication addressing the design optimization of active and passive control systems. This title is perfect for engineers, professionals, professors, and students alike, providing cutting edge research and applications.

Digital Transformation of the Design, Construction and Management Processes of the Built Environment Springer Science & Business Media

This book illustrates the computational framework based on knowledge of flow and mass transfer together with optimization techniques to solve problems relevant to micromixing technology. The authors provide a detailed analysis of the different numerical techniques applied to the design of micromixers. Flow and mixing analysis is based on both the Eulerian and Lagrangian approaches; relative advantages and disadvantages of the two methods and suitability to different types of mixing problems are analysed. The book also discusses the various facets of numerical schemes subjected to discretization errors and computational grid requirements. Since a large number of studies are based on commercial computational fluid dynamics (CFD) packages, relevant details of these packages to the mixing problem using them are presented. Numerical optimization techniques coupled with CFD analysis of flow and mixing have proved to be an important tool for micromixers design, and therefore, are an important part of the book. These techniques are presented briefly, and focus is on surrogate modeling and optimization applied to design of micromixers.

Advanced Multifunctional Lightweight Aerostructures Artech House

On the other hand, various interactions between microwave devices and their environment, such as feeding structures and housing, must be taken into account, and this is only possible through full-wave EM analysis. Electromagnetic simulations can be highly accurate, but they tend to be computationally expensive. Therefore, practical design optimization methods have to be computationally efficient, so that the number of CPU-intensive high-fidelity EM simulations is reduced as much as possible during the design process. For the same reasons, techniques for creating fast yet accurate models of microwave structures become crucially important. In this edited book, the authors strive to review the state-of-the-art simulation-driven microwave design optimization and modeling. A group of international experts specialized in various aspects of microwave computer-aided design summarize and review a wide range of the latest developments and real-world applications.

Analysis and Design Optimization of Micromixers Taylor & Francis

The definitive compendium for the Insurance Digital Revolution From slow beginnings in 2014, InsurTech has captured US\$7billion in investment since 2010 — a 10% annual compound growth rate is predicted until at least 2020. Three in four insurance companies believe some part of their business is at risk of disruption and understanding the trends, drivers and emerging technologies behind Insurance's Digital Revolution is a business-critical priority for all growth-minded firms. The InsurTech Book offers essential updates, critical thinking and actionable insight — globally — from start-ups, incumbents, investors, tech companies, advisors and other partners in this evolving ecosystem, in one volume. For some, Insurance is either facing an existential threat; for others, it is a sector on the brink of transforming itself. Either way, business models, value chains, customer understanding and engagement, organisational structures and even what Insurance is for, is never going to be the same. Be informed, be part of it. Learn from diverse experiences, mindsets and applications of technologies Discover new ways of defining and grasping growth opportunities Get the inside track from innovators, disruptors and incumbents Be updated on the evolution of InsurTech, why it is happening and how it will evolve Explore visions of the future of Insurance to help shape yours The InsurTech Book is your indispensable guide to a sector in transformation.

Mass Transport & Reactive Barriers in Packaging SIAM

This open access book is a compilation of selected papers from 2020 DigitalFUTURES-The 2nd International Conference on Computational Design and Robotic Fabrication (CDRF 2020). The book focuses on novel techniques for computational design and robotic fabrication. The contents make valuable contributions to academic researchers, designers, and engineers in the industry. As well, readers will encounter new ideas about understanding intelligence in architecture.

Optimization of Multilayered Radar Absorbing Structures (RAS) using Nature Inspired Algorithm Academic Press

Energy Modeling in Architectural Design demonstrates how design elements can lead to energy savings, to help you reduce the energy footprint of your buildings. In addition to identifying climate opportunities, you'll also learn fundamental passive design elements for software-agnostic energy modeling of your projects from conception. Using parametric models and testing each element during design will lead you to create beautiful and high-performance buildings. Illustrated with more than 100 color images, this book also includes a pattern guide for high-performance buildings, discusses energy and daylighting optimization, and has a glossary for easy reference.

Building Performance Simulation for Design and Operation John Wiley & Sons

Design and Performance Optimization of Renewable Energy Systems provides an integrated discussion of issues relating to renewable energy performance design and optimization using advanced thermodynamic analysis with modern methods to configure major renewable energy plant configurations (solar, geothermal, wind, hydro, PV). Vectors of performance enhancement reviewed include thermodynamics, heat transfer, exergoeconomics and neural network techniques. Source technologies studied range across geothermal power plants, hydroelectric power, solar power towers, linear concentrating PV, parabolic trough solar collectors, grid-tied hybrid solar PV/Fuel cell for freshwater production, and wind energy systems. Finally, nanofluids in renewable energy systems are reviewed and discussed from the heat transfer enhancement perspective. - Reviews the fundamentals of thermodynamics and heat transfer concepts to help engineers overcome design

challenges for performance maximization - Explores advanced design and operating principles for solar, geothermal and wind energy systems with diagrams and examples - Combines detailed mathematical modeling with relevant computational analyses, focusing on novel techniques such as artificial neural network analyses - Demonstrates how to maximize overall system performance by achieving synergies in equipment and component efficiency

Assessing the Performance of Passive Houses in Mediterranean Climate Regions CRC Press

Maintaining a stable level of power quality in the distribution network is a growing challenge due to increased use of power electronics converters in domestic, commercial and industrial sectors. Power quality deterioration is manifested in increased losses; poor utilization of distribution systems; mal-operation of sensitive equipment and disturbances to nearby consumers, protective devices, and communication systems. However, as the energy-saving benefits will result in increased AC power processed through power electronics converters, there is a compelling need for improved understanding of mitigation techniques for power quality problems. This timely book comprehensively identifies, classifies, analyses and quantifies all associated power quality problems, including the direct integration of renewable energy sources in the distribution system, and systematically delivers mitigation techniques to overcome these problems. Key features: • Emphasis on in-depth learning of the latest topics in power quality extensively illustrated with waveforms and phasor diagrams. • Essential theory supported by solved numerical examples, review questions, and unsolved numerical problems to reinforce understanding. • Companion website contains solutions to unsolved numerical problems, providing hands-on experience. Senior undergraduate and graduate electrical engineering students and instructors will find this an invaluable resource for education in the field of power quality. It will also support continuing professional development for practicing engineers in distribution and transmission system operators.

Applied Optimization with MATLAB Programming Earthscan

In this book, leading international experts explore the emerging concept of the zero energy mass custom home (ZEMCH) - designed to meet the need for social, economic, and environmental sustainability - and provide all of the knowledge required for the delivery of zero energy mass customized housing and community developments in developed and developing countries. The coverage is wide ranging, progressing from explanation of the meaning of sustainable development to discussion of challenges and trends in mass housing, the advantages and disadvantages of prefabricated methods of construction, and the concepts of mass customization, mass personalization, and inclusive design. A chapter on energy use will aid the reader in designing and retrofitting housing to reduce energy demand and/or improve energy end-use efficiency. Passive design strategies and active technologies (especially solar) are thoroughly reviewed. Application of the ZEMCH construction criteria to new buildings and refurbishment of old houses is explained and the methods and value of building performance simulation, analyzed. The concluding chapter presents examples of ZEMCH projects from around the world, with discussion of marketing strategy, design, quality assurance, and delivery challenges. The book will be invaluable as a training/teaching tool for both students and industry partners.

Passive Network Synthesis: An Approach to Classification IGI Global

This is a design guide for architects, engineers, and contractors concerning the principles and specific applications of building information modeling (BIM). BIM has the potential to revolutionize the building industry, and yet not all architects and construction professionals fully understand what the benefits of BIM are or even the fundamental concepts behind it. As part of the PocketArchitecture Series it includes two parts: fundamentals and applications, which provide a comprehensive overview of all the necessary and essential issues. It also includes case studies from a range of project sizes that illustrate the key concepts clearly and use a wide range of visual aids. Building Information Modeling addresses the key role that BIM is playing in shaping the software tools and office processes in the architecture, engineering, and construction professions. Primarily aimed at professionals, it is also useful for faculty who wish to incorporate this information into their courses on digital design, BIM, and professional practice. As a compact summary of key ideas it is ideal for anyone implementing BIM.

Op Amps for Everyone Elsevier

The four-volume set LNCS 13350, 13351, 13352, and 13353 constitutes the proceedings of the 22nd International Conference on Computational Science, ICCS 2022, held in London, UK, in June 2022.* The total of 175 full papers and 78 short papers presented in this book set were carefully reviewed and selected from 474 submissions. 169 full and 36 short papers were accepted to the main track; 120 full and 42 short papers were accepted to the workshops/ thematic tracks. *The conference was held in a hybrid format Chapter "GPU Accelerated Modelling and Forecasting for Large Time Series" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Simulation-Driven Design Optimization and Modeling for Microwave Engineering John Wiley & Sons

Delivering the best possible solution for phase noise and output power efficiency in oscillators This complete and thorough analysis of microwave oscillators investigates all aspects of design, with particular emphasis on operating conditions, choice of resonators and transistors, phase noise, and output power. It covers both bipolar transistors and FETs. Following the authors' guidance, readers learn how to design microwave oscillators and VCOs that can be tuned over a very wide frequency range, yet have good phase noise, are low cost, and are small in size. All the essential topics in oscillator design and development are covered, including: * Device and resonator technology * Study of noise sources * Analysis methods * Design, calculation, and optimization methodologies * Practical design of single and coupled oscillators While most of the current literature in the field concentrates on classic design strategies based on measurements, simulation, and optimization of output power and phase noise, this text offers a unique approach that focuses on the complete understanding of the design process. The material demonstrates important design rules starting with the selection of best oscillator topology, choice of transistors, and complete phase noise analysis that leads to optimum performance of all relevant oscillator features. Also included are CMOS oscillators, which recently have become important in cellular applications. For readers interested in specialized applications and topics, a full chapter provides all the necessary references. The contents of the text fall into two major categories: * Chapters 1 through 9 deal with a very detailed and expanded single resonator oscillator, including a thorough treatment of both nonlinear analysis and phase noise * Chapters 10 and 11 use the knowledge obtained and apply it to multiple coupled

oscillators (synchronized oscillators) This text is partially based on research sponsored by the DefenseAdvanced Research Projects Agency (DARPA) and the United StatesArmy and conducted by Synergy Microwave Corporation. With thewealth of information provided for the analysis and practicaldesign of single and synchronized low-noise microwave oscillators,it is recommended reading for all RF microwave engineers. Inaddition, the text's comprehensive, step-by-step approach makes itan excellent graduate-level textbook.

Design and Optimization of Passive UHF RFID Systems Springer Nature

Various structures, such as buildings, bridges, and paved roads play an important role in our lives. However, these construction projects require large expenditures. Designing infrastructure cost-efficiently while satisfying all necessary design constraints is one of the most important and difficult tasks for a structural engineer. Traditionally, mathematical gradient-based optimization techniques have been applied to these designs. However, these gradient-based methods are not suitable for discrete design variables such as factory-made cross sectional area of structural members. Recently, researchers have turned their interest to phenomenon-mimicking optimization techniques because these techniques have proved able to efficiently handle discrete design variables. One of these techniques is harmony search, an algorithm developed from musical improvisation that has been applied to various structural design problems and has demonstrated cost-savings. This book gathers all the latest developments relating to the application of the harmony search algorithm in the structural design field in order for readers to efficiently understand the full spectrum of the algorithm's potential and to easily apply the algorithm to their own structural problems. This book contains six chapters with the following subjects: standard harmony search algorithm and its applications by Lee; standard harmony search algorithm for steel frame design by Degertekin; adaptive harmony search algorithm and its applications by Saka and Hasançebi; harmony particle swarm algorithm and its applications by Li and Liu; hybrid algorithm of harmony search, particle swarm and ant colony for structural design by Kaveh and Talatahari; and parameter calibration of viscoelastic and damage functions by Mun and Geem.

Design and Performance Optimization of Renewable Energy Systems John Wiley & Sons

The operational amplifier ("op amp") is the most versatile and widely used type of analog IC, used in audio and voltage amplifiers, signal conditioners, signal converters, oscillators, and analog computing systems. Almost every electronic device uses at least one op amp. This book is Texas Instruments' complete professional-level tutorial and reference to operational amplifier theory and applications. Among the topics covered are basic op amp physics (including reviews of current and voltage division, Thevenin's theorem, and transistor models), idealized op amp operation and configuration, feedback theory and methods, single and dual supply operation, understanding op amp parameters, minimizing noise in op amp circuits, and practical applications such as instrumentation amplifiers, signal conditioning, oscillators, active filters, load and level conversions, and analog computing. There is also extensive coverage of circuit construction techniques, including circuit board design, grounding, input and output isolation, using decoupling capacitors, and frequency characteristics of passive components. The material in this book is applicable to all op amp ICs from all manufacturers, not just TI. Unlike textbook treatments of op amp theory that tend to focus on idealized op amp models and configuration, this title uses idealized models only when necessary to explain op amp theory. The bulk of this book is on real-world op amps and their applications; considerations such as thermal effects, circuit noise, circuit buffering, selection of appropriate op amps for a given application, and unexpected effects in passive components are all discussed in detail. *Published in conjunction with Texas Instruments *A single volume, professional-level guide to op amp theory and applications *Covers circuit board layout techniques for manufacturing op amp circuits.

Advances in Linear Matrix Inequality Methods in Control Springer Nature

Offers a review of the newest methodologies for the characterization and modelling of lightweight materials and structures Advances in Multifunctional Lightweight Structures offers a text that provides and in-depth analyses of the thermal, electrical and mechanical responses of multi-functional lightweight structures. The authors, noted experts on the topic, address the most recent and innovative methodologies for the characterization and modelling of lightweight materials and discuss various shell and plate theories. They present multifunctional materials and structures and offer detailed descriptions of the complex modelling of these structures. The text is divided into three sections that demonstrate a keen understanding and awareness for multi-functional lightweight structures by taking a unique approach. The authors explore multi-disciplinary modelling and characterization alongside benchmark problems and applications, topics that are rarely approached in this field. This important book: • Offers an analyses of the thermal, electrical and mechanical responses of multi-functional lightweight structures • Covers innovative methodologies for the characterization and modelling of lightweight materials and structures • Presents a characterization of a wide variety of novel materials • Considers multifunctional novel structures with potential applications in different high-tech industries • Includes efficient and highly accurate methodologies Written for professionals, engineers and researchers in industrial and other specialized research institutions, Advances in Multifunctional Lightweight Structures offers a much needed text to the design practices of existing engineering building services and how these methods combine with recent developments.

CMOS-Compatible Key Engineering Devices for High-Speed Silicon-Based Optical Interconnections DEStech Publications, Inc

This book contains selected papers from SEB-18, the Tenth International Conference on Sustainability in Energy and Buildings, which was organised by KES International and Griffith University and held in Gold Coast, Australia in June 2018. SEB-18 invited contributions on a range of topics related to sustainable buildings and renewable energy, and explored innovative topics regarding intelligent buildings and cities. Applicable areas included the sustainable design and of buildings, neighbourhoods and cities (built and natural environment); optimisation and modelling

techniques; smart energy systems for smart cities; green information communications technology; and a broad range of solar, wind, wave and other renewable energy topics. The aim of the conference was to bring together researchers and government and industry professionals to discuss the future of energy in buildings, neighbourhoods and cities from a theoretical, practical, implementation and simulation perspective. In addition, SEB-18 offered an exciting opportunity to present, interact, and learn about the latest research in Sustainability in Energy and Buildings.

Design Optimization of Active and Passive Structural Control Systems MDPI

Building energy design is currently going through a period of major changes. One key factor of this is the adoption of net-zero energy as a long term goal for new buildings in most developed countries. To achieve this goal a lot of research is needed to accumulate knowledge and to utilize it in practical applications. In this book, accomplished international experts present advanced modeling techniques as well as in-depth case studies in order to aid designers in optimally using simulation tools for net-zero energy building design. The strategies and technologies discussed in this book are, however, also applicable for the design of energy-plus buildings. This book was facilitated by International Energy Agency's Solar Heating and Cooling (SHC) Programs and the Energy in Buildings and Communities (EBC) Programs through the joint SHC Task 40/EBC Annex 52: Towards Net Zero Energy Solar Buildings R&D collaboration. After presenting the fundamental concepts, design strategies, and technologies required to achieve net-zero energy in buildings, the book discusses different design processes and tools to support the design of net-zero energy buildings (NZEBS). A substantial chapter reports on four diverse NZEBs that have been operating for at least two years. These case studies are extremely high quality because they all have high resolution measured data and the authors were intimately involved in all of them from conception to operating. By comparing the projections made using the respective design tools with the actual performance data, successful (and unsuccessful) design techniques and processes, design and simulation tools, and technologies are identified. Written by both academics and practitioners (building designers) and by North Americans as well as Europeans, this book provides a very broad perspective. It includes a detailed description of design processes and a list of appropriate tools for each design phase, plus methods for parametric analysis and mathematical optimization. It is a guideline for building designers that draws from both the profound theoretical background and the vast practical experience of the authors.

The Design of Modern Microwave Oscillators for Wireless Applications Springer

This book results from a Special Issue related to the latest progress in the thermodynamics of machines systems and processes since the premonitory work of Carnot. Carnot invented his famous cycle and generalized the efficiency concept for thermo-mechanical engines. Since that time, research progressed from the equilibrium approach to the irreversible situation that represents the general case. This book illustrates the present state-of-the-art advances after one or two centuries of consideration regarding applications and fundamental aspects. The research is moving fast in the direction of economic and environmental aspects. This will probably continue during the coming years. This book mainly highlights the recent focus on the maximum power of engines, as well as the corresponding first law efficiency upper bounds.

Whole System Design Springer

Whole System Design is increasingly being seen as one of the most cost-effective ways to both increase the productivity and reduce the negative environmental impacts of an engineered system. A focus on design is critical as the output from this stage of the project locks in most of the economic and environmental performance of the designed system throughout its life which can span from a few years to many decades. Indeed it is now widely acknowledged that all designers - particularly engineers architects and industrial designers - need to be able to understand and implement a whole system design approach. This book provides a clear design methodology based on leading efforts in the field and is supported by worked examples that demonstrate how advances in energy materials and water productivity can be achieved through applying an integrated approach to sustainable engineering. Chapters 1-5 outline the approach and explain how it can be implemented to enhance the established Systems Engineering framework. Chapters 6-10 demonstrate through detailed worked examples the application of the approach to industrial pumping systems passenger vehicles electronics and computer systems temperature control of buildings and domestic water systems. Published with The Natural Edge Project the World Federation of Engineering Organizations UNESCO and the Australian Government.

2024 the 8th International Conference on Energy and Environmental Science (ICEES 2024) World Scientific

The advantages of optical communications are many: ultra-high speed, highly reliable information transmission, and cost-effective modulation and transmission links to name but a few. It is no surprise that optical fiber communications systems are now in extensive use all over the world. Along with software and microelectronics, optical communication represents a key technology of modern telecommunication systems. Optical Communications: Components and Systems provides the basic material required for advanced study in theory and applications of optical fiber and space communication systems. After a review of some fundamental background material, component-based chapters discuss all relevant passive and active optical and optoelectronic components used in point-to-point links and in networks. Systems chapters address the analysis and optimization of both incoherent and coherent systems, introduce fiber optic link design, and discuss physical limits. The authors also provide an overview of applications such as optical networks and optical free-space communications. The advanced interactive multimedia communications of today and the future rely on optical fiber and space communication techniques. Optical Communications: Components and Systems offers engineers and physicists a working reference for the selection and design of optical communication systems and provides engineering students with a valuable text that prepares them for work in this essential and rapidly growing field.