Design Time Ratios Langevin

Although the highly anticipated petascale computers of the near future will perform at an order of magnitude faster than today's quickest supercomputer, the scaling up of algorithms and applications for this class of computers remains a tough challenge. From scalable algorithm design for massive concurrency toperformance analyses and scientific visualization, Petascale Computing: Algorithms and Applications captures the state of the art in high-performance computing algorithms and applications. Featuring contributions from the world's leading experts in computational science, this edited collection explores the use of petascale computers for solving the most difficult scientific and engineering problems of the current century. Covering a wide range of important topics, the book illustrates how petascale computing can be applied to space and Earth science missions, biological systems, weather prediction, climate science, disasters, black holes, and gamma ray bursts. It details the simulation of multiphysics, cosmological evolution, molecular dynamics, and biomolecules. The book also discusses computational aspects that include the Uintah framework, Enzo code, multithreaded algorithms, petaflops, performance analysis tools, multilevel finite element solvers, finite element code development, Charm++, and the Cactus framework. Supplying petascale tools, programming methodologies, and an eight-page color insert, this volume addresses the challenging problems of developing application codes that can take advantage of the architectural features of the new petascale systems in advance of their first deployment.

A comprehensive and up-to-date collection of papers on the role of electrodynamical activities in biocommunication is presented in this volume. It provides research findings, practical applications and theoretical investigations linking phenomena as diverse as the sensitivity of organisms to ultraweak ELF electromagnetic fields, noninvasive imaging by magnetic field tomography, coherent liquid crystalline mesophases in living organisms and coherent light emission from biological systems. The volume begins with chapters on the historical perspectives and the biophysical background necessary for understanding bioelectrical phenomena. This is followed by chapters dealing with the biological effects of external electromagnetic fields; the detection of endogenous electrodynamical and related activities and their practical applications; and finally, theoretical perspectives and overviews. It is recommended for undergraduates, graduates and research scientists in all disciplines who wish to be informed of the emerging discipline of bioelectrodynamics. List of Contributors: M Bischof, J J Chang, A S Davydov, D Edmonds, A French, C Gross, Q Gu, J Haffegee, M W Ho, A A Ioannides, R P Liburdy, W P Mei, R Pethig, F A Popp, P T Saunders; C W Smith, T Y Tsong, U Warnke, T M Wu, C L Zhang. Contents:The History of Bioelectromagnetism (M Bischof)Electromagnetism and Living Systems (F A Popp)Biological Effects of Weak Electromagnetic Fields (C W Smith)Possible Mechanisms for Biological Effects of Weak ELF Electromagnetic Fields (D T Edmonds)The Language of Cells — Molecular Processing of Electric Signals by Cell Membranes (T Y Tsong & C J Gross)Electromagnetic Fields and Biomembranes (R P Liburdy)Can Weak Magnetic Fields (or Potentials) Affect Pattern Formation? (M-W Ho et al.)Liquid Crystalline Mesophases in Living Organisms (M-W Ho & P T Saunders)Dielectric and AC Electrodynamic Properties of Cells (R Pethig)Dynamic Cell-Membrane Events Following the Application of Signal-Pulse Electric Fields (J J Chang et al.)On the Biological Nature of Biophotons (W-P Mei)Nonsubstantial Biocommunication in Terms of Dicke's Theory (F A Popp et al.)Estimates of Brain Activity Using Magnetic Field Tomography and Large Scale Communication within the Brain (A A Ioannides)Log-Normal Distribution of Physiological Parameters and Coherence of Biological Systems (C L Zhang & F A Popp)Electromagnetic Sensitivity of Animals and Humans: Biological and Clinical Implications (U Warnke)Fröhlich's Theory of Coherent Excitation — A Retrospective (T M Wu)Energy and Electron Transport in Biological Systems (A S Davydov)Bioelectrodynamics and Biocommunication — An Epilogue (M-W Ho & F A Popp) Readership: Researchers, graduate and undergraduate students in biophysics. Keywords:Bioelectromagnetics;Em Hypersensitivity;Bioeffects Of-;Em Fields;Microwaves;Millimetre Waves;Magnetic Flux Quanta;Magnetic Vector Potentials;Electrosmog;Thermal Effects;Non-Thermal Effects;Sensitivity;Biophotons;Solitons;Nonsubstantial Communication;Fröhlich's Theory;Coherence;Resonance;Electromagnetic-Bioinformation;Magneto-Sensibility;Magneto-Therapy;Electrostimuli;Electro/Magneto-Pollution;Electromagnetic Molecule-Oscillation

The classic guide to instructional design, fully updated for thenew ways we learn Rapid Instructional Design is the industry standard guideto creating effective instructional materials, providingno-nonsense practicality rather than theory-driven text. Beginningwith a look at what "instructional design" really means, readersare guided step-by-step through the ADDIE model to exploretechniques for analysis, design, development, intervention, andevaluation. This new third edition has been updated to cover newapplications, technologies, and concepts, and includes many newtemplates, real-life examples, and additional instructor materials.Instruction delivery has expanded rapidly in the nine years sincethe second edition's publication, and this update covers all themajor advances in the field. The major instructional models areexpanded to apply to e-learning, MOOCs, mobile learning, and socialnetwork-based learning. Informal learning and communities ofpractice are examined, as well. Instructional design is the systematic process by whichinstructional materials are designed, developed, and delivered.Designers must determine the learner's current state and needs,define the end goals of the instruction, and create an interventionto assist in the transition. This book is a complete guide to theprocess, helping readers design efficient, effective materials. Learn the ins and outs of the ADDIE model Discover shortcuts for rapid design Design for e-learning, Millennials, and MOOCs Investigate methods for emerging avenues of instruction This book does exactly what a well-designed course should do,providing relevant guidance for anyone who wants to know how toapply good instructional design. Eminently practical and fullyup-to-date, Rapid Instructional Design is the one-stop guideto more effective instruction.

In Optoelectronic Integrated Circuit Design and Device Modeling, Professor Jianjun Gao introduces the fundamentals and modeling techniques of optoelectronic devices used in high-speed optical transmission systems. Gao covers electronic circuit elements such as FET, HBT, MOSFET, as well as design techniques for advanced optical transmitter and receiver front-end circuits. The book includes an overview of optical communication systems and computer-aided optoelectronic IC design before going over the basic concept of laser diodes. This is followed by modeling and parameter extraction techniques of lasers and photodiodes. Gao covers high-speed electronic semiconductor devices, optical transmitter design, and optical receiver design in the final three chapters. Addresses a gap within the rapidly growing area of transmitter and receiver modeling in OEICs Explains diode physics before device modeling, helping readers understand their equivalent circuit models Provides comprehensive explanations for E/O and O/E conversions done with laser and photodiodes Covers an extensive range of devices for high-speed applications Accessible for students new to microwaves Presentation slides available for instructor use This book is primarily aimed at practicing engineers, researchers, and post-graduates in the areas of RF, microwaves, IC design, photonics and lasers, and solid state devices. The book is also a strong supplement for senior undergraduates taking courses in RF and microwaves. Lecture materials for instructors available at www.wiley.com/go/gao

Advances in Hydroscience, Volume 1 considers the physical theories and mathematical analyses of a broad spectrum of specialized subjects in various branches of hydroscience, including hydrodynamics, hydrology, hydrochemistry, hydrophysics, hydrobiology, hydrometeorology, oceanology, hydrogeology, naval science, and water resources. This book contains five chapters, and begins with a presentation of scientific and engineering advances in the field of sonar and hydroelasticity. The following chapter deals with the fundamental principles and concepts of statistical hydrodynamics in porous media and their significance in various engineering applications. These topics are followed by a discussion on the concepts of theoretical incompressible fluid dynamics, with a special emphasis on the field of hydroballistics. The last chapter provides first a brief introduction to the basic principles and fundamental equations of well hydraulics, followed by a survey of its importance to water economy in arid and semiarid regions of the world. This book will be of great value to research workers and practitioners in the interdisciplinary field of hydroscience.

Neutron Applications in Earth, Energy and Environmental Sciences offers a comprehensive overview of the wide ranging applications of neutron scattering techniques to elucidate the fundamental materials properties at the nano-, micro- and meso-scale, which underpin research in the related fields of Earth, Energy and Environmental Sciences. Introductions to neutron scattering fundamentals and instrumentation are paired with a thorough review of the applications to a large variety of scientific and technological problems, written through the direct experience of leading scientists in each field. Tailored to a wide audience, this volume provides the novice with an inspiring introduction and stimulates the expert to consider these non-conventional problem solving techniques in his/her field of interest. Earth and environmental scientists, engineers, researchers and graduate students involved with materials science will find Neutron Applications in Earth, Energy and Environmental Sciences a valuable ready-to-use reference.

Nonlinear Approaches in Engineering Applications 2 focuses on the application of nonlinear approaches to different engineering and science problems. The selection of the topics for this book is based on the best papers presented in the ASME 2010 and 2011 in the tracks of Dynamic Systems and Control, Optimal Approaches in Nonlinear Dynamics and Acoustics, both of which were organized by the editors. For each selected topic, detailed concept development, derivations and relevant knowledge are provided for the convenience of the readers. The topics that have been selected are of great interest in the fields of engineering and physics and this book is designed to appeal to engineers and researchers working in a broad range of practical topics and approaches.

Prigogine and Rice's highly acclaimed series, Advances in Chemical Physics, provides a forum for critical, authoritative reviews of current topics in every area of chemical physics. Edited by J.K. Vij, this volume focuses on recent advances in liquid crystals with significant, up-to-date chapters authored by internationally recognized researchers in the field.

Driven in part by the development of genomics, proteomics, and bioinformatics as new disciplines, there has been a tremendous resurgence of interest in physical methods to investigate macromolecular structure and function in the context of living cells. This volume in Methods in Cell Biology is devoted to biophysical techniques in vitro and their applications to cellular biology. Biophysical Tools for Biologists covers methods-oriented chapters on fundamental as well as cutting-edge techniques in molecular and cellular biophysics. This book is directed toward the broad audience of cell biologists, biophysicists, pharmacologists, and molecular biologists who employ classical and modern biophysical technologies or wish to expand their expertise to include such approaches. It will also interest the biomedical and biotechnology communities for biophysical characterization of drug formulations prior to FDA approval. Describes techniques in the context of important biological problems Delineates critical steps and potential pitfalls for each method Includes full-color plates to illustrate techniques

This book systematically introduces readers to the fundamental physics and a broad range of applications of acoustic levitation, one of the most promising techniques for the container-free handling of small solid particles and liquid droplets. As it does away with the need for solid walls and can easily be incorporated into analysis instruments, acoustic levitation has attracted considerable research interest in many fields, from fluid physics to material science. The book offers a comprehensive overview of acoustic levitation, including the history of acoustic radiation force; the design and development of acoustic levitators; the technology's applications, ranging from drop dynamics studies to bio/chemical analysis; and the insightful perspectives that the technique provides. It also discusses the latest advances in the field, from experiments to numerical simulations. As such, the book provides readers with a clearer understanding of acoustic levitation, while also stimulating new research areas for scientists and engineers in physics, chemistry, biology, medicine and other related fields.

Singular perturbations and time-scale techniques were introduced to control engineering in the late 1960s and have since become common tools for the modeling, analysis, and design of control systems. In this SIAM Classics edition of the 1986 book, the original text is reprinted in its entirety (along with a new preface), providing once again the theoretical foundation for representative control applications. This book continues to be essential in many ways. It lays down the foundation of singular perturbation theory for linear and nonlinear systems, it presents the methodology in a pedagogical way that is not available anywhere else, and it illustrates the theory with many solved examples, including various physical examples and applications. So while new developments may go beyond the topics covered in this book, they are still based on the methodology described here, which continues to be their common starting point.

Dr. Sergio Decherchi and Dr. Andrea Cavalli are co-founders of BiKi Technologies s.r.l. - a company that commercializes a Molecular Dynamics-based software suite for drug discovery. All other Topic Editors

declare no competing interests with regards to the Research Topic subject.

In the current drug research environment in academia and industry, cheminformatics and virtual screening methods are well established and integrated tools. Computational tools are used to predict a compound's 3D structure, the 3D structure and function of a pharmacological target, ligand-target interactions, binding energies, and other factors essential for a successful drug. This includes molecular properties such as solubility, logP value, susceptibility to metabolism, cell permeation, blood brain barrier permeation, interaction with drug transporters and potential off-target effects. Given that approximately 40 million unique compounds are readily available for purchase, such computational modeling and filtering tools are essential to support the drug discovery and development process. The aim of all these calculations is to focus experimental efforts on the most promising candidates and exclude problematic compounds early in the project. In this Research Topic on virtual activity predictions, we cover several aspects of this research area such as historical perspectives, data sources, ligand treatment, virtual screening methods, hit list handling and filtering.

The 1985/86 apparition of Halley's Comet turned out to be the most important apparition of a comet ever. It provided a worldwide science community with a wealth of exciting new discoveries, the most remarkable of which was undoubtedly the first image of a cometary nucleus. Halley's Comet is the brightest periodic comet, and the most famous of the 750 known comets. With its 76-year period, its recent appearance was truly a "once-in-a-lifetime" observational opportunity. The 1985/86 apparition was the thirtieth consecutive recorded apparition. Five apparitions ago, the English astronomer Edmond Halley discovered the periodicity of "his" comet and correctly predicted its return in 1758, a triumph for science best appreciated in the context of contemporary views, or rather fears, about comets at that time. The increasingly rapid progress in technological development is very much apparent when one compares the dominant tools for cometary research during Halley's next three apparitions: in 1835 studies were made based on drawings ofthe comet; in 1910 photographic plates were used; while in March 1986 an armada of six spacecraft from four space agencies approached the comet and carried out in situ measurements, 1 AU from the Earth. In 1910, nobody could have dreamed that this was possible, and today it is equally difficult to anticipate what scientists will be able to achieve in 2061.

This volume, in conjunction with the two volumes LNCS 4681 and LNAI 4682, constitutes the refereed proceedings of the Third International Conference on Intelligent Computing held in Qingdao, China, in August 2007. The conference sought to establish contemporary intelligent computing techniques as an integral method that underscores trends in advanced computational intelligence and links theoretical research with applications.

Reflecting the substantial increase in popularity of quadrupole ion traps and Fourier transform ion cyclotron resonance (FT-ICR) mass spectrometers, Practical Aspects of Trapped Ion Mass Spectrometry, Volume IV: Theory and Instrumentation explores the historical origins of the latest advances in this expanding field. It covers new methods for trapping ions, such as the OrbitrapTM, the digital ion trap (DIT), the rectilinear ion trap (RIT), and the toroidal ion trap; the development and application of the quadrupole ion trap (QIT) and the quadrupole linear ion trap (LIT); and the introduction of high-field asymmetric waveform ion mobility spectrometry (FAIMS). After a combined appreciation and historical survey of mass spectrometry and a discussion of how improved capabilities for microfabrication have led to interest in arrays of ion traps, the book examines the theory and practice of the Orbitrap mass analyzer, the rectangular waveform-driven DIT mass spectrometer, FAIMS, and ion traps with circular geometries. It next discusses ion accumulation for increasing sensitivity in FT-ICR spectrometry, a radio frequency-only-mode event for Penning traps in FT MS, and an FT operating mode applied to a 3D-QIT. The text then presents three behavioral aspects of quadrupole rod sets, before illustrating the development of the 3D-QIT in recent years. The final chapters explore photodissociation in ion traps and the chemical and photochemical studies of metal dication complexes in a 3D-QIT. In this volume that spans twenty-one chapters, a stellar panel of leading experts and up-and-coming researchers presents a cohesive, global, and up-to-date view of the practical aspects of using trapped ion devices. A companion to Volume V: Applications of Ion Trapping Devices, the book authoritatively covers the theory involved as well as the instrumentation currently used in this dynamic field.

Interest in filter theory and design has been growing with the telecommunications industry since the late nineteenth century. Now that telecommunications has become so critical to industry, filter research has assumed even greater importance at companies and academic institutions around the world. The CRC Handbook of Electrical Filters fills in the gaps for engineers and scientists who need a basic introduction to the subject. Unlike the currently available textbooks, which are filled with detailed, highly technical analysis geared to the specialist, this practical guide provides useful information for the non-specialist about the various types of filters, their design, and applications. The handbook covers approximation theory and methods and introduces CAD packages that perform approximation and synthesis for both analog and digital filters. Also included are design methods for LCR, active-RC, digital, mechanical, and switched capacitor (SC) filters. A thorough survey of current design trends rounds out this complete assessment of a key field of study.

UK Colloids 2011 - the first multi-day conference on the topic of colloid science held in the UK for many years, jointly organized by the RSC Colloid and Interface Science Group and the SCI Colloid and Surface Science Group. The conference had over 250 delegates, from all across the world – good representation from Japan, China, Australia, USA, France, Germany, Holland, Sweden, Spain, Poland, Georgia – as well as a substantial number of UK based researchers. This Special Issue of "Progress in Colloid and Polymer Science" collects together a selection of 20 papers, mostly presented during the Conference. The papers included cover the wide variety of topics from fundamentals in colloid and interface science to industrial applications. The current Special Issue also reflects the international character of the Conference.

Provides first-hand insights into advanced fabrication techniques for solution processable organic electronics materials and devices The field of printable organic electronics has emerged as a technology which plays a major role in materials science research and development. Printable organic electronics soon compete with, and for specific applications can even outpace, conventional semiconductor devices in terms of performance, cost, and versatility. Printing techniques allow for large-scale fabrication of organic electronic components and functional devices for use as wearable electronics, health-care sensors, Internet of Things, monitoring of environment pollution and many others, yet-to-be-conceived applications. The first part of Solution-Processable Components for Organic Electronic Devices covers the synthesis of: soluble conjugated polymers; solution-processable nanoparticles of inorganic semiconductors; high-k nanoparticles by means of controlled radical polymerization; advanced blending techniques yielding novel materials with extraordinary properties. The book also discusses photogeneration of charge carriers in nanostructured bulk heterojunctions and charge carrier transport in multicomponent materials such as composites and nanocomposites as well as photovoltaic devices modelling. The second part of the book is devoted to organic electronic devices, such as field effect transistors, light emitting diodes, photovoltaics, photodiodes and electronic memory devices which can be produced by solution-based methods, including printing and roll-to-roll manufacturing. The book provides in-depth knowledge for experienced researchers and for those entering the field. It comprises 12 chapters focused on: ? novel organic electronics components synthesis and solution-based processing techniques ? advanced analysis of mechanisms governing charge carrier generation and transport in organic semiconductors and devices ? fabrication techniques and characterization methods of organic electronic devices Providing coverage of the state of the art of organic electronics, Solution-Processable Components for Organic Electronic Devices is an excellent book for materials scientists, applied physicists, engineering scientists, and those working in the electronics industry.

This book focuses on guidelines for reducing the energy consumption in warehousing processes. It presents a model of formal assessment for energy consumption in the context of storage-system logistics, as well as a computational model consisting of three sub-models: energy consumption models for forklifts and stacker cranes, respectively, and an energy intensity model for roller conveyors. The concept model is based on the assumption that the unit load is received at a zero-energy warehouse. Subsequent handling, transport and storage processes, in which the unit load is moved vertically and horizontally through the system, equate to changes in energy intensity within the logistics warehouse management system. Energy recovery based on the handling equipment used can be collected in batteries. The evaluation method takes into account the intensity of the energy supplied to the logistics system and reduces the storage of the recovered energy - this figure represents the energy needed to pass through the logistics unit load storage system, and can be expressed in an energy intensity map.

Present worldwide funding in organic electronics is poised to stimulate major research and development efforts in organic materials research for lighting, photovoltaic, and other optoelectronic applications. The field of organic spintronics, in particular, has flourished in the area of organic magneto-transport. Reflecting the main avenues of substantial advances in this arena, Organic Spintronics is an up-to-date summary of the experimental and theoretical aspects of the field. With contributions by a panel of international experts on the cutting edge of research, this volume explores: Spin injection and manipulation in organic spin valves The magnetic field effect in organic light-emitting diodes (OLEDs) The spin transport effect in relation to spin manipulation Organic magnets as spin injection electrodes in organic spintronics devices The coherent control of spins in organic devices using the technique of electronically detected magnetic resonance The possibility of using organic spin valves as sensors Balancing practical experimentation with analytical constructs, the book covers both the theoretical aspects of spin injection, transport, and detection in organic spin valves as well as the underlying mechanism of the magnetoresistance and magneto-electroluminescence in OLEDs. The first book of its kind on this specialized area, this volume is destined to provide researchers and students with the impetus to develop new channels of inquiry in an area that has almost limitless potential.

Solid State Physics, Volume 71 provides the latest volume in this long-running series. This latest volume highlights new advances in the field, with this new volume presenting interesting chapters written by an international board of authors. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Solid State Physics series Offers an updated release that includes the latest information in solid state physics

This is the second edition of the best-selling book that shows how to get instructional design done fast and get it done right! If you need a basic understanding of what instructional design is and a hands-on, to-the-point method of ensuring that the training and performance interventions you put into place meet the needs of your staff and your organization, this book is for you. It offers a no-nonsense walk through all the steps in the instructional design process and each step is explained in language that is conversational and easy to understand. This new edition addresses such topics as learning analysis, return on investment, and designing asynchronous and synchronous e-learning, as well as a wealth of illustrative examples of storyboards and professional commentary and case studies from professionals in the field.

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