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## Data Analytics in Bioinformatics

## A Machine Learning Perspective

**John Wiley & Sons** Machine learning techniques are increasingly being used to address problems in computational biology and bioinformatics. Novel machine learning computational techniques to analyze high throughput data in the form of sequences, gene and protein expressions, pathways, and images are becoming vital for understanding diseases and future drug discovery. Machine learning techniques such as Markov models, support vector machines, neural networks, and graphical models have been successful in analyzing life science data because of their capabilities in handling randomness and uncertainty of data noise and in generalization. Machine Learning in Bioinformatics compiles recent approaches in machine learning methods and their applications in addressing contemporary problems in bioinformatics approximating classification and prediction of disease, feature selection, dimensionality reduction, gene selection and classification of microarray data and many more.

## Bioinformatics Computing

**Prentice Hall Professional** Comprehensive and concise, this handbook has chapters on computing visualization, large database designs, advanced pattern matching and other key bioinformatics techniques. It is a practical guide to computing in the growing field of Bioinformatics--the study of how information is represented and transmitted in biological systems, starting at the molecular level.

## Computation in BioInformatics

## Multidisciplinary Applications

**John Wiley & Sons** Bioinformatics is a platform between the biology and information technology. The book covers a broad spectrum of the bioinformatics fields starting from the basic principles, concepts, and multidisciplinary application areas. It comprises a collection of chapters describing the role of bioinformatics in drug design and discovery including the molecular modeling aspects; chapters detailing topics such as in silico design, protein modeling, DNA Microarray Analysis, DNA-RNA barcoding, gene sequencing; specialized topics such as bioinformatics in cancer detection, genomics, proteomics, machine learning, covalent approaches in drug design

## Pervasive Cloud Computing Technologies: Future Outlooks and Interdisciplinary Perspectives

## Future Outlooks and Interdisciplinary Perspectives

**IGI Global** Technology trends may come and go, but cloud computing technologies have been gaining consideration in the commercial world due to its ability to provide on-demand access to resources, control the software environment, and supplement existing systems. Pervasive Cloud Computing Technologies: Future Outlooks and Interdisciplinary Perspectives explores the latest innovations with cloud computing and the impact of these new models and technologies. This book will present case studies and research on the future of cloud computing technologies and its ability to increase connectivity of various entities of the world. It is an essential resource for technology practitioners, engineers, managers, and academics aiming to gain the knowledge of these novel and pervasive technologies.

## Bioinformatics and Molecular Evolution

**John Wiley & Sons** In the current era of complete genome sequencing, Bioinformatics and Molecular Evolution provides an up-to-date and comprehensive introduction to bioinformatics in the context of evolutionary biology. This accessible text: provides a thorough examination of sequence analysis, biological databases, pattern recognition, and applications to genomics, microarrays, and proteomics emphasizes the theoretical and statistical methods used in bioinformatics programs in a way that is accessible to biological science students places bioinformatics in the context of evolutionary biology, including population genetics, molecular evolution, molecular phylogenetics, and their applications features end-of-chapter problems and self-tests to help students synthesize the materials and apply their understanding is accompanied by a dedicated website - www.blackwellpublishing.com/higgs - containing downloadable sequences, links to web resources, answers to self-test questions, and all artwork in downloadable format (artwork also available to instructors on CD-ROM). This important textbook will equip readers with a thorough understanding of the quantitative methods used in the analysis of molecular evolution, and will be essential reading for advanced undergraduates, graduates, and researchers in molecular biology, genetics, genomics, computational biology, and bioinformatics courses.

## Developing Bioinformatics Computer Skills

**"O'Reilly Media, Inc."** Offers a structured approach to biological data and the computer tools needed to analyze it, covering UNIX, databases, computation, Perl, data mining, data visualization, and tailoring software to suit specific research needs.

## First International Conference on Artificial Intelligence and Cognitive Computing

## AICC 2018

**Springer** This book presents original research works by researchers, engineers and practitioners in the field of artificial intelligence and cognitive computing. The book is divided into two parts, the first of which focuses on artificial intelligence (AI), knowledge representation, planning, learning, scheduling, perception-reactive AI systems, evolutionary computing and other topics related to intelligent systems and computational intelligence. In turn, the second part focuses on cognitive computing, cognitive science and cognitive informatics. It also discusses applications of cognitive computing in medical informatics, structural health monitoring, computational intelligence, intelligent control systems, bio-informatics, smart manufacturing, smart grids, image/video processing, video analytics, medical image and signal processing, and knowledge engineering, as well as related applications.

## Big Data Governance and Perspectives in Knowledge Management

**IGI Global** The world is witnessing the growth of a global movement facilitated by technology and social media. Fueled by information, this movement contains enormous potential to create more accountable, efficient, responsive, and effective governments and businesses, as well as spurring economic growth. Big Data Governance and Perspectives in Knowledge Management is a collection of innovative research on the methods and applications of applying robust processes around data, and aligning organizations and skillsets around those processes. Highlighting a range of topics including data analytics, prediction analysis, and software development, this book is ideally designed for academicians, researchers, information science professionals, software developers, computer engineers, graduate-level computer science students, policymakers, and managers seeking current research on the convergence of big data and information governance as two major trends in information management.

## Bioinformatics for Geneticists

**John Wiley & Sons**

## Multidisciplinary Perspectives on Telecommunications, Wireless Systems, and Mobile

# Computing

**IGI Global** The development of new information and communication technologies has a considerable impact on the way humans interact with each other and their environment. The proper use of these technologies is an important consideration in the success of modern human endeavors. Multidisciplinary Perspectives on Telecommunications, Wireless Systems, and Mobile Computing explores some of the latest advances in wireless communication technologies, making use of empirical research and analytical case studies to evaluate best practices in the discipline. This book will provide insight into the next generation of information and communication technologies for developers, engineers, students, researchers, and managers in the telecommunications field.

# Textbook Of Bioinformatics, A: Information-theoretic Perspectives Of Bioengineering And Biological Complexes

**World Scientific** This book on bioinformatics is designed as an introduction to the conventional details of genomics and proteomics as well as a practical comprehension text with an extended scope on the state-of-the-art bioinformatic details pertinent to next-generation sequencing, translational/clinical bioinformatics and vaccine-design related viral informatics.It includes four major sections: (i) An introduction to bioinformatics with a focus on the fundamentals of information-theory applied to biology/microbiology, with notes on bioinformatic resources, data bases, information networking and tools; (ii) a collection of annotations on the analytics of biomolecular sequences, with pertinent details presented on biomolecular informatics, pairwise and multiple sequences, viral sequence informatics, next-generation sequencing and translational/clinical bioinformatics; (iii) a novel section on cytogenetic and organelle bioinformatics explaining the entropy-theoretics of cellular structures and the underlying informatics of synteny correlations; and (iv) a comprehensive presentation on phylogeny and species informatics.The book is aimed at students, faculty and researchers in biology, health/medical sciences, veterinary/agricultural sciences, bioengineering, biotechnology and genetic engineering. It will be a useful companion for managerial personnel in the biotechnology and bioengineering industries as well as in health/medical science.

# Computational Science – ICCS 2009

# 9th International Conference Baton Rouge, LA, USA, May 25-27, 2009 Proceedings, Part I

**Springer** "There is something fascinating about science. One gets such wholesale returns of conjecture out of such a tri?ing investment of fact. " Mark Twain, Life on the Mississippi The challenges in succeeding with computational science are numerous and deeply a?ect all disciplines. NSF's 2006 Blue Ribbon Panel of Simulation-Based 1 Engineering Science (SBES) states 'researchers and educators [agree]: com- tational and simulation engineering sciences are fundamental to the security and welfare of the United States. . . We must overcome di?culties inherent in multiscale modeling, the development of next-generation algorithms, and the design. . . of dynamic data-driven application systems. . . We must determine better ways to integrate data-intensive computing, visualization, and simulation. - portantly,wemustoverhauloureducationalsystemtofostertheinterdisciplinary study. . . The payo?sformeeting these challengesareprofound. 'The International Conference on Computational Science 2009 (ICCS 2009) explored how com- tational sciences are not only advancing the traditional hard science disciplines, but also stretching beyond, with applications in the arts, humanities, media and all aspects of research. This interdisciplinary conference drew academic and industry leaders from a variety of ?elds, including physics, astronomy, mat-matics,music,digitalmedia,biologyandengineering. Theconferencealsohosted computer and computational scientists who are designing and building the - ber infrastructure necessary for next-generation computing. Discussions focused on innovative ways to collaborate and how computational science is changing the future of research. ICCS 2009: 'Compute. Discover. Innovate. ' was hosted by the Center for Computation and Technology at Louisiana State University in Baton Rouge.

# Encyclopedia of Networked and Virtual Organizations

**IGI Global** [Administration (référence électronique) ; informatique].

# Perspectives on Digital Pathology

# Results of the COST Action IC0604 EURO-TELEPATH

**IOS Press** Multimedia information and digital images are increasingly important in the field of healthcare, but establishing an adequate technological framework for their management, and workable international standards to ensure compatibility and interoperability, are crucial if they are to be employed effectively. This book presents the main research efforts of EURO-TELEPATH, an initiative of the European Corporation in Science and Technology (COST) Action, IC0604. This program began in November 2007, and ran until November 2011. Its aim was to develop the standards and solutions necessary to represent, interpret, browse and retrieve digital medical images, while preserving their diagnostic quality for clinical purposes, education and research. At the end of the project, the most relevant researchers in the field of digital pathology – many of whom had been active members of EURO-TELEPATH – were asked to contribute to a book which would compile the main research efforts of the European COST Action consortium. The book is divided into six parts. The first is an introduction to the instruments and activities of COST. This is followed by sections dealing with: the state-of-the-art in pathology; pathology business modeling; standards and specifications in pathology; the analysis, processing, retrieval and management of images; technology and automation in pathology; and strategic developments and emerging research. As well as being a comprehensive overview of the IC0604 COST program, the book includes a selection of papers from American and Japanese researchers working in the same field.

# The Elements of Computing Systems

# Building a Modern Computer from First Principles

**Mit Press** This title gives students an integrated and rigorous picture of applied computer science, as it comes to play in the construction of a simple yet powerful computer system.

# Structural Bioinformatics of Membrane Proteins

**Springer Science & Business Media** This book is the first one specifically dedicated to the structural bioinformatics of membrane proteins. With a focus on membrane proteins from the perspective of bioinformatics, the present work covers a broad spectrum of topics in evolution, structure, function, and bioinformatics of membrane proteins focusing on the most recent experimental results. Leaders in the field who have recently reported breakthrough advances cover algorithms, databases and their applications to the subject. The increasing number of recently solved membrane protein structures makes the expert coverage presented here very timely. Structural bioinformatics of membrane proteins has been an active area of research over the last thee decades and proves to be a growing field of interest.

# Allergy Frontiers:Future Perspectives

**Springer Science & Business Media** When I entered the field of allergy in the early 1970s, the standard textbook was a few hundred pages, and the specialty was so compact that texts were often authored entirely by a single individual and were never larger than one volume. Compare this with Allergy Frontiers: Epigenetics, Allergens, and Risk Factors, the present s- volume text with well over 150 contributors from throughout the world. This book captures the explosive growth of our specialty since the single-author textbooks referred to above. The unprecedented format of this work lies in its meticulous attention to detail yet comprehensive scope. For example, great detail is seen in manuscripts dealing with topics such as "Exosomes, naturally occurring minimal antigen presenting units" and "Neuropeptide S receptor 1 (NPSR1), an asthma susceptibility gene." The scope is exemplified by the unique approach to disease entities normally dealt with in a single chapter in most texts. For example, anaphylaxis, a topic usually confined to one chapter in most textbooks, is given five chapters in Allergy Frontiers. This approach allows the text to employ multiple contributors for a single topic, giving the reader the advantage of being introduced to more than one vi- point regarding a single disease.

# Bioinformatics

# A Swiss Perspective

**World Scientific** Biological research and recent technological advances have resulted in an enormous increase in research data that require large storage capacities, powerful computing resources, and accurate data analysis algorithms. Bioinformatics is the field that provides these resources to life science researchers.The Swiss Institute of Bioinformatics (SIB), which has celebrated its 10th anniversary in 2008, is an institution of national importance, recognized worldwide for its state-of-the-art work. Organized as a federation of bioinformatics research groups from Swiss universities and research institutes, the SIB provides services to the life science community that are highly appreciated worldwide, and coordinates research and education in bioinformatics nationwide. The SIB plays a central role in life science research both in Switzerland and abroad by developing extensive and high-quality bioinformatics resources that are essential for all life scientists. Knowledge developed by SIB members in areas such as genomics, proteomics, and systems biology is directly transformed by academia and industry into innovative solutions to improve global health. Such an astounding concentration of talent in

a given field is unusual and unique in Switzerland.This book provides an insight into some of the key areas of activity in bioinformatics in Switzerland. With contributions from SIB members, it covers both research work and major infrastructure efforts in genome and gene expression analysis, investigations on proteins and proteomes, evolutionary bioinformatics, and modeling of biological systems.

# Networks of Networks in Biology

## Concepts, Tools and Applications

**Cambridge University Press** Introduces network inspired approaches for the analysis and integration of large, heterogeneous data sets in the life sciences.

# Best Practices and New Perspectives in Service Science and Management

**IGI Global** Within global commerce, services and management play a vital role in the economy. Service systems are necessary for organizations, and a multi-disciplinary approach is ideal to establish full understanding of these systems. Best Practices and New Perspectives in Service Science and Management provides original research on all aspects of service science, service management, service engineering, and its supporting technology in order to administer cutting-edge knowledge to encourage the improvement of services. This book is essential for researchers and practitioners in the fields of computer science, software management, and engineering.

# Perspectives on Wearable Enhanced Learning (WELL)

## Current Trends, Research, and Practice

**Springer** Wearable technologies – such as smart glasses, smart watches, smart objects, or smart garments – are potential game-changers, breaking ground and offering new opportunities for learning. These devices are body-worn, equipped with sensors, and integrate ergonomically into everyday activities. With wearable technologies forging new human-computer relations, it is essential to look beyond the current perspective of how technologies may be used to enhance learning. This edited volume,"Perspectives on Wearable Enhanced Learning," aims to take a multidisciplinary view on wearable enhanced learning and provide a comprehensive overview of current trends, research, and practice in diverse learning contexts including school and work-based learning, higher education, professional development, vocational training, health and healthy aging programs, smart and open learning, and work. This volume features current state of the art wearable enhanced learning and explores how these technologies have begun to mark the transition from the desktop through the mobile to the age of wearable, ubiquitous technology-enhanced learning.

# Integrative Bioinformatics

## History and Future

**Springer** This book provides an overview of the history of integrative bioinformatics and the actual situation and the relevant tools. Subjects cover the essential topics, basic introductions, and latest developments; biological data integration and manipulation; modeling and simulation of networks; as well as a number of applications of integrative bioinformatics. It aims to provide basic introduction of biological information systems and guidance for the computational analysis of systems biology. This book covers a range of issues and methods that unveil a multitude of omics data integration and relevance that integrative bioinformatics has today. It contains a unique compilation of invited and selected articles from the Journal of Integrative Bioinformatics (JIB) and annual meetings of the International Symposium on Integrative Bioinformatics.

# Handbook of Research on Holistic Perspectives in Gamification for Clinical Practice

**IGI Global** Over the past decade, the healthcare industry has adopted games as a powerful tool for promoting personal health and wellness. Utilizing principles of gamification to engage patients with positive reinforcement, these games promote stronger attention to clinical and self-care guidelines, and offer exciting possibilities for primary prevention. Targeting an audience of academics, researchers, practitioners, healthcare professionals, and even patients, the Handbook of Research on Holistic Perspectives in Gamification for Clinical Practices reviews current studies and empirical evidence, highlights critical principles of gamification, and fosters the increasing application of games at the practical, clinical level.

# Environmental Health Perspectives

## EHP.

## Genetics, Ethics and Education

**Cambridge University Press** A thorough cross-disciplinary exploration of the implications of genomics-influenced educational practice, for consideration by scientists, practitioners and laypersons alike.

# Modeling in Computational Biology and Biomedicine

## A Multidisciplinary Endeavor

**Springer Science & Business Media** Computational biology, mathematical biology, biology and biomedicine are currently undergoing spectacular progresses due to a synergy between technological advances and inputs from physics, chemistry, mathematics, statistics and computer science. The goal of this book is to evidence this synergy by describing selected developments in the following fields: bioinformatics, biomedicine and neuroscience. This work is unique in two respects - first, by the variety and scales of systems studied and second, by its presentation: Each chapter provides the biological or medical context, follows up with mathematical or algorithmic developments triggered by a specific problem and concludes with one or two success stories, namely new insights gained thanks to these methodological developments. It also highlights some unsolved and outstanding theoretical questions, with a potentially high impact on these disciplines. Two communities will be particularly interested in this book. The first one is the vast community of applied mathematicians and computer scientists, whose interests should be captured by the added value generated by the application of advanced concepts and algorithms to challenging biological or medical problems. The second is the equally vast community of biologists. Whether scientists or engineers, they will find in this book a clear and self-contained account of concepts and techniques from mathematics and computer science, together with success stories on their favorite systems. The variety of systems described represents a panoply of complementary conceptual tools. On a practical level, the resources listed at the end of each chapter (databases, software) offer invaluable support for getting started on a specific topic in the fields of biomedicine, bioinformatics and neuroscience.

# Expanding Perspectives on Open Science: Communities, Cultures and Diversity in Concepts and Practices

## Proceedings of the 21st International Conference on Electronic Publishing

**IOS Press** Twenty-one years ago, the term 'electronic publishing' promised all manner of potential that the Web and network technologies could bring to scholarly communication, scientific research and technical innovation. Over the last two decades, tremendous developments have indeed taken place across all of these domains. One of the most important of these has been Open Science; perhaps the most widely discussed topic in research communications today. This book presents the proceedings of Elpub 2017, the 21st edition of the International Conference on Electronic Publishing, held in Limassol, Cyprus, in June 2017. Continuing the tradition of bringing together academics, publishers, lecturers, librarians, developers, entrepreneurs, users and all other stakeholders interested in the issues surrounding electronic publishing, this edition of the conference focuses on Open Science, and the 27 research and practitioner papers and 1 poster included here reflect the results and ideas of researchers and practitioners with diverse backgrounds from all around the world with regard to this important subject.Intended to generate discussion and debate on the potential and limitations of openness, the book addresses the current challenges and opportunities in the ecosystem of Open Science, and explores how to move forward in developing an inclusive system that will work for a much broader range of participants. It will be of interest to all those concerned with electronic publishing, and Open Science in particular.

# Intelligent Computing Everywhere

**Springer Science & Business Media** This book reflects the current perception in various fields that modern computing applications are becoming increasingly challenged in terms of complexity and intelligence. It investigates the relevance and relationship artificial intelligence maintains with "modern strands of computing". These consist of pervasive computing and ambient intelligence, bioinformatics, neuroinformatics, computing and the mind, non-classical computing and novel computing models, as well as DNA computing and quantum computing.

# Computers and Society

## Modern Perspectives

**Oxford University Press, USA** The last century has seen enormous leaps in the development of digital technologies, and most aspects of modern life have changed significantly with their widespread availability and use. Technology at various scales - supercomputers, corporate networks, desktop and laptop computers, the internet, tablets, mobile phones, and processors that are hidden in everyday devices and are so small you can barely see them with the naked eye - all pervade our world in a major way. Computers and Society: Modern Perspectives is a wide-ranging and comprehensive textbook that critically assesses the global technical achievements in digital technologies and how are they are applied in media; education and learning; medicine and health; free speech, democracy, and government; and war and peace. Ronald M. Baecker reviews critical ethical issues raised by computers, such as digital inclusion, security, safety, privacy,automation, and work, and discusses social, political, and ethical controversies and choices now faced by society. Particular attention is paid to new and exciting developments in artificial intelligence and machine learning, and the issues that have arisen from our complex relationship with AI.

# High Performance Computing

## First HPCLATAM - CLCAR Latin American Joint Conference, CARLA 2014, Valparaiso, Chile, October 20-22, 2014. Proceedings

**Springer** This book constitutes the refereed proceedings of the First HPCLATAM - CLCAR Joint Latin American High Performance Computing Conference, CARLA 2014, held in Valparaiso, Chile, in October 2014. The 17 revised full papers and the one paper presented were carefully reviewed and selected from 42 submissions. The papers are organized in topical sections on grid and cloud computing; HPC architectures and tools; parallel programming; scientific computing.

# Bioinformatics and Phylogenetics

## Seminal Contributions of Bernard Moret

**Springer** This volume presents a compelling collection of state-of-the-art work in algorithmic computational biology, honoring the legacy of Professor Bernard M.E. Moret in this field. Reflecting the wide-ranging influences of Prof. Moret's research, the coverage encompasses such areas as phylogenetic tree and network estimation, genome rearrangements, cancer phylogeny, species trees, divide-and-conquer strategies, and integer linear programming. Each self-contained chapter provides an introduction to a cutting-edge problem of particular computational and mathematical interest. Topics and features: addresses the challenges in developing accurate and efficient software for the NP-hard maximum likelihood phylogeny estimation problem; describes the inference of species trees, covering strategies to scale phylogeny estimation methods to large datasets, and the construction of taxonomic supertrees; discusses the inference of ultrametric distances from additive distance matrices, and the inference of ancestral genomes under genome rearrangement events; reviews different techniques for inferring evolutionary histories in cancer, from the use of chromosomal rearrangements to tumor phylogenetics approaches; examines problems in phylogenetic networks, including questions relating to discrete mathematics, and issues of statistical estimation; highlights how evolution can provide a framework within which to understand comparative and functional genomics; provides an introduction to Integer Linear Programming and its use in computational biology, including its use for solving the Traveling Salesman Problem. Offering an invaluable source of insights for computer scientists, applied mathematicians, and statisticians, this illuminating volume will also prove useful for graduate courses on computational biology and bioinformatics.

# Global Perspectives on Health Communication in the Age of Social Media

**IGI Global** Numerous studies suggest that people with a variety of health concerns are increasingly turning to online networks for social support. As a result, the number of online support communities has risen over the past two decades. Global Perspectives on Health Communication in the Age of Social Media is a critical scholarly resource that examines the illness and pain-and-suffering narrative of health communication. Featuring coverage on a broad range of topics, such as social networks, patient empowerment, and e-health, this book is geared towards professionals and researchers in health informatics as well as students, practitioners, clinicians, and academics.

# Bioinformatics

## A Practical Guide to the Analysis of Genes and Proteins

**John Wiley & Sons** "In this book, Andy Baxevanis and Francis Ouellette . . . haveundertaken the difficult task of organizing the knowledge in thisfield in a logical progression and presenting it in a digestibleform. And they have done an excellent job. This fine text will makea major impact on biological research and, in turn, on progress inbiomedicine. We are all in their debt." —Eric Lander from the Foreword Reviews from the First Edition "...provides a broad overview of the basic tools for sequenceanalysis ... For biologists approaching this subject for the firsttime, it will be a very useful handbook to keep on the shelf afterthe first reading, close to the computer." —Nature Structural Biology "...should be in the personal library of any biologist who usesthe Internet for the analysis of DNA and protein sequencedata." —Science "...a wonderful primer designed to navigate the novice throughthe intricacies of in scripto analysis ... The accomplished genesearcher will also find this book a useful addition to theirlibrary ... an excellent reference to the principles ofbioinformatics." —Trends in Biochemical Sciences This new edition of the highly successful Bioinformatics:A Practical Guide to the Analysis of Genes and Proteinsprovides a sound foundation of basic concepts, with practicaldiscussions and comparisons of both computational tools anddatabases relevant to biological research. Equipping biologists with the modern tools necessary to solvepractical problems in sequence data analysis, the Second Editioncovers the broad spectrum of topics in bioinformatics, ranging fromInternet concepts to predictive algorithms used on sequence,structure, and expression data. With chapters written by experts inthe field, this up-to-date reference thoroughly covers vitalconcepts and is appropriate for both the novice and the experiencedpractitioner. Written in clear, simple language, the book isaccessible to users without an advanced mathematical or computerscience background. This new edition includes: All new end-of-chapter Web resources, bibliographies, andproblem sets Accompanying Web site containing the answers to the problems,as well as links to relevant Web resources New coverage of comparative genomics, large-scale genomeanalysis, sequence assembly, and expressed sequence tags A glossary of commonly used terms in bioinformatics andgenomics Bioinformatics: A Practical Guide to the Analysis of Genesand Proteins, Second Edition is essential reading forresearchers, instructors, and students of all levels in molecularbiology and bioinformatics, as well as for investigators involvedin genomics, positional cloning, clinical research, andcomputational biology.

## Pattern Recognition and Machine Learning

**Springer** This is the first textbook on pattern recognition to present the Bayesian viewpoint. The book presents approximate inference algorithms that permit fast approximate answers in situations where exact answers are not feasible. It uses graphical models to describe probability distributions when no other books apply graphical models to machine learning. No previous knowledge of pattern recognition or machine learning concepts is assumed. Familiarity with multivariate calculus and basic linear algebra is required, and some experience in the use of probabilities would be helpful though not essential as the book includes a self-contained introduction to basic probability theory.

## Introduction to Protein-DNA Interactions

## Structure, Thermodynamics, and Bioinformatics

One of the foundations of molecular biology is how the interactions of proteins with DNA control many aspects of gene expression. Since the mid-20th century discoveries of the lac repressor and operator and the competition between the cI and cro proteins for the same segment of DNA, we have learned an enormous amount about the interactions of proteins with DNA and their control of fundamental processes in the cell. Introduction to Protein-DNA Interactions: Structure, Thermodynamics, and Bioinformatics describes what we know about protein-DNA interactions from the complementary perspectives of molecular and structural biology and bioinformatics and how each perspective informs the others. A particular emphasis is on how insights from experimental work can be translated into specific computational approaches to create unified view of the field and a fuller understanding of protein-DNA interactions.

## Modern Physical Chemistry: Engineering Models, Materials, and Methods with Applications

**CRC Press** This volume brings together innovative research, new concepts, and novel developments in the application of new tools for chemical engineers. It presents significant research, reporting on new methodologies and important applications in the field of chemical engineering. Highlighting theoretical foundations, real-world cases, and future directions, this book covers selected topics in a variety of areas, including: chemoinformatics and computational chemistry advanced dielectric materials nanotechniques polymer composites It also presents several advanced case studies. The topics discussed in this volume will be valuable for researchers, practitioners, professionals, and students of chemistry material and chemical engineering.

## Introduction to Bioinformatics

The ideal text for biology students encountering bioinformatics for the first time, Introduction to Bioinformatics describes how recent technological advances in the field can be used as a powerful set of tools for receiving and analyzing biological data.

## Cognitive Agents for Virtual Environments

## First International Workshop, CAVE 2012, Held at AAMAS 2012, Valencia, Spain, June 4, 2012, Revised Selected Papers

**Springer** This book constitutes the refereed post-proceedings of the First International Workshop on Cognitive Agents for Virtual Environments, CAVE 2012, held at AAMAS 2012, in Valencia, Spain, in June 2012. The 10 full papers presented were thoroughly reviewed and selected from 14 submissions. In addition one invited high quality contribution has been included. The papers are organized in the following topical sections: coupling agents and game engines; using games with agents for education; visualization and simulation; and evaluating games with agents.

## Formal Modeling: Actors; Open Systems, Biological Systems

## Essays Dedicated to Carolyn Talcott on the Occasion of Her 70th Birthday

**Springer** This Festschrift volume, published in honor of Carolyn Talcott on the occasion of her 70th birthday, contains a collection of papers presented at a symposium held in Menlo Park, California, USA, in November 2011. Carolyn Talcott is a leading researcher and mentor of international renown among computer scientists. She has made key contributions to a number of areas of computer science including: semantics and verification of progamming languages; foundations of actor-based systems; middleware, meta-architectures, and systems; Maude and rewriting logic; and computational biology. The 21 papers presented are organized in topical sections named: Essays on Carolyn Talcott; actors and programming languages; cyberphysical systems; middleware and meta-architectures; formal methods and reasoning tools; and computational biology.

## Applied Physical Chemistry with Multidisciplinary Approaches

**CRC Press** Presenting illustrative case studies, highlighting technological applications, and explaining theoretical and foundational concepts, this book is an important reference source on the key concepts for modern technologies and optimization of new processes in physical chemistry. This volume combines up-to-date research findings and relevant theoretical frameworks on applied chemistry, materials, and chemical engineering. This new volume presents an up-to-date review of modern materials and chemistry concepts, issues, and recent advances in the field. Distinguished scientists and engineers from key institutions worldwide have contributed chapters that provide a deep analysis of their particular subjects. At the same time, each topic is framed within the context of a broader more multidisciplinary approach, demonstrating its relationship and interconnectedness to other areas. The premise of this book, therefore, is to offer both a comprehensive understanding of applied science and engineering as a whole and a thorough knowledge of individual subjects. This approach appropriately conveys the basic fundamentals, state-of-the-art technology, and applications of the involved disciplines, and further encourages scientific collaboration among researchers. This volume emphasizes the intersection of chemistry, math, physics, and the resulting applications across many disciplines of science and explores applied physical chemistry principles in specific areas, including the life chemistry, environmental sciences, geosciences, and materials sciences. The applications from these multidisciplinary fields illustrate methods that can be used to model physical processes, design new products and find solutions to challenging problems.