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Sci-Tech Book News Reviews

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Sci-Tech Book News Reviews Susan Fingerman, Selector



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PSYCHOLOGY

BF76 2009-024842 978-1-4338-0695-7

Advanced methods for conducting online behavioral research.

Title main entry. Ed. by Samuel D. Gosling and John A. Johnson.

American Psychological Assn., ©2010 286 p. \$79.95

Written for students and researchers already familiar with the basics of Web-page construction, uploading, and maintenance at the level presented in, for example, Fraley's *How to Conduct Behavioral Research Over the Internet: A Beginner's Guide to HTML and CGI/Perl* (2004), Gosling (psychology, U. of Texas) and Johnson (psychology, Pennsylvania State U.) have aimed this book one level above the Fraley text, for those who want more information on more specific topics and on new methods of online behavioral research (such as text analysis) They present 16 self-contained tutorial chapters, organized into sections providing an overview of major techniques; discussing considerations when designing Web pages; describing methods for studying Internet behavior; describing how to transport traditional methodologies to the Web; and examining cross-cutting issues such as the use of incentives, ethical issues, and security and data protection.

GEOGRAPHY, HYDROLOGY, ENVIRONMENT

G70 2009-015958 978-0-470-72211-4

Kernel methods for remote sensing 1; data analysis 2.

Camps-Valls, Gustavo and Lorenzo Bruzzone.

John Wiley & Sons, ©2009 403 p. \$135.00 (pa)

This work presents research related to remote sensing techniques based on recent advances in kernel methods. Two early chapters provide background on machine learning techniques in remote sensing data analysis, and theoretical and practical foundations of kernel methods. The rest of book addresses recent research in developing kernel methods in remote sensing for supervised classification, semi-supervised classification, regression, and feature extraction. Some specific topics covered include the support vector machine (SVM) algorithm, a domain adaptation SVM for land-cover map updating, kernel methods for unmixing hyperspectral imagery, kernel-based quantitative remote sensing inversion, and kernel multivariate analysis in remote sensing feature extraction.

The book is for engineers, scientists, and researchers involved in remote sensing data processing. Camps-Valls teaches in the Department of Electronics Engineering at the University of Valencia, Spain. Bruzzone is professor of telecommunications at the University of Trento, Italy.

HF5548 2009-934713 978-1-60750-052-0

Techniques and applications for mobile commerce; proceedings.

TAMoCo (2009). (Frontiers in artificial intelligence and applications, v.201)

IOS Press, ©2009 169 p. \$145.00 (pa)

Papers from a 2009 conference describe recent international work in mobile commerce devices, and discuss issues of interoperability, usability, security, and privacy in the context of mobile services and commerce. Material is in sections on mobile technologies in urban systems and education, autonomic computing and mobile commerce, and context-aware and Web services for mobile systems. Some specific topics include aspect-oriented techniques for web services and their mobile clients, transaction management in mobile computing, adaptive learning using Moodle and handheld devices, and wireless city initiatives in Europe. Other topics are a model-driven framework for autonomic mobile commerce engineering, location constraints for mobile workflows, and a swarm intelligence solution for financial documents.

HV6773 978-1-84392-524-8

Handbook of internet crime.

Title main entry. Ed. by Yvonne Jewkes and Majid Yar.

Willan Publishing, ©2010 654 p. \$59.95 (pa)

Jewkes (criminology, U. of Leicester, UK) and Yar (criminology, U. of Hull, UK) compile 28 essays on cybercrime for criminologists, students, and researchers. Scholars in criminology, sociology, social theory, media and communication studies, information technology, psychology, politics, law, and socio-legal studies from the US, Europe, and Australia consider issues and debates related to internet crime, including its history and social, political, and economic contexts; forms, threats, and risks from hackers, viruses, terrorism, cyber-protest, intellectual property crime, identity theft and fraud, the sex industry, child pornography and sexual exploitation, and cyber-suicide and homicide; laws and regulations in the UK, US, and transnationally; and policing. Distributed in the US by ISBS.

KF27 978-1-60692-320-7

Aviation and the environment.

Title main entry. Ed. by Jon C. Goodman.

Nova Science Publishers, ©2009 515 p. \$95.00

Nine white papers from the Aviation-Climate Change Research Initiative (ACCRI) report findings by meteorologists and other earth and environmental scientists on upper troposphere and lower stratosphere chemistry and transport, the climatic impact of contrails and contrail cirrus, contrail-specific microphysics, contrail/cirrus optics and radiation, metrics for comparing climate impacts from well mixed greenhouse gases and inhomogeneous forcing such as those from ozone and contrails, climate metrics and aviation, and research and development as keys to reducing emissions and their impact on health and climate.

SCIENCE (GENERAL)

Q295 2009-035001 978-0-521-76505-3

Handbook of hybrid systems control; theory, tools, applications.

Title main entry. Ed. by Jan Lunze and Françoise Lamnabhi-Lagarrigue.

Cambridge U. Press, ©2009 565 p. \$95.00

As systems combining components with continuous and discrete behavior, hybrid systems raise important methodological issues of modeling, analysis, and design because they necessitate the combination of continuous variable system descriptions like differential and difference equations with discrete-event models like automata or Petri nets. This handbook, edited by Lunze (Institute of Automation and Computer Control, Ruhr-U. Bochum, Germany) and Lamnabhi-Lagarrigue (Director of Research, Signals and Systems Laboratory, National Center of Scientific Research, France), surveys the main approaches, methods, and results from the last decade of research in the field and also reviews new phenomena and theoretical problems. Hybrid systems theory is described, with an emphasis on analysis and control design. Hybrid automata, switched systems, mixed logical dynamical systems, complementarity systems, quantized systems, and stochastic hybrid systems are among the approaches explained. The focus then switches to describing the tools needed for computer-aided systems analysis, control design, and verification, as well as the issue of tool integration. Finally, applications to energy management, industrial controls, automotive control, networked control, and solar air conditioning are described.

Q325 2009-021595 978-1-60566-810-9

Machine learning methods for commonsense reasoning processes; interactive models.

Naidenova, Xenia.

Information Science Reference, ©2010 410 p. \$180.00

This book demonstrates the possibility of transforming machine learning algorithms into integrated commonsense reasoning processes in which inductive and deductive inferences correlate and support one another. Methodological approaches to the organization of data and knowledge in

intelligent computer systems are discussed. Examples are given of expert system construction via machine learning mechanisms. Early chapters cover logic-based reasoning in the framework of artificial intelligence, the coordination of commonsense reasoning operations, the logical rules of commonsense reasoning, and human commonsense reasoning processes. Later chapters describe an integrative model of deductive-inductive commonsense reasoning, a model of fuzzy commonsense reasoning, object-oriented technology for expert system generation, and case technology for psycho-diagnostic system generation. The book is for logicians and mathematicians working with the theory of classification and models of logical inference. It will also interest specialists in artificial intelligence, machine learning algorithms, and knowledge engineering. Naidenova is the head of Project DIALOG: Methods of Data Mining in Psychological and Physiological Diagnostics, at the Military Medical Academy, St. Petersburg, Russia.

Q335 2009-015920 978-0-470-33187-3

Diagrammatic reasoning in AI.

Nakatsu, Robbie.

John Wiley & Sons, ©2010 330 p. \$110.00

Nakatsu (finance and computer information systems, Loyola Marymount U.) examines the use of diagrams to help learners understand complex ideas, and how diagrammatic user interfaces can help us better understand and visualize artificial intelligence (AI) systems. The author considers how diagrammatic reasoning enhances various AI programming strategies, including expert systems, model-based reasoning, inexact reasoning such as certainty factors and Bayesian networks, and logic reasoning. To address diagrammatic reasoning in a coherent, unified way, Nakatsu also proposes classification of the variety of diagrams in use today within six categories: system typology, sequence and flow, hierarchy and classification, association, cause and effect, and logic reasoning. Suitable for practitioners and researchers in AI and human-computer interaction, business and computing professionals, graphic designers and designers of graphical user interfaces, and noncomputing professionals interested in the power of diagrams, the text assumes no prior knowledge of AI or mathematics beyond high school algebra.

MATH, COMPUTERS

QA76.575 2009-022437 978-1-4200-9338-4

Ubiquitous multimedia computing.

Title main entry. Ed. by Qing Li and Timothy K. Shih. (Chapman & Hall/CRC studies in informatics series)

CRC / Taylor & Francis, ©2010 392 p. \$89.95

Including contributions from dozens of leading experts, this book describes ubiquitous multimedia computing on the levels of infrastructures, middleware, and applications. Contributors examine various architectures for delivering multimedia content, including streaming devices, wireless networks, and hybrids. This volume is a valuable reference for researchers working in product development and human computer interaction, and

will also interest engineers, doctors, educators, and graduate students interested in multimedia computing.

QA76.58 2009-031419 978-0-470-07294-3

Advanced computational infrastructures for parallel and distributed adaptive applications.

Title main entry. Ed. by Manish Parashar and Xiaolin Li.

John Wiley & Sons, ©2010 518 p. \$135.00

This work brings together recent research on the design of large-scale adaptive scientific and engineering applications, and describes applications of interest to system architects, software engineers, computational scientists, and application scientists. The first part of the book describes real-world application scenarios, such as parallel computing engines for subsurface imaging technologies, in order to demonstrate their uses and requirements. The second part identifies widely used adaptive computational infrastructures, such as the Uintah framework. The third part of the book investigates partitioning and runtime management issues, with chapters on areas such as mesh partitioning for efficient use of distributed systems, and physics aware optimization methods. The book can be used as resource for professionals, and for advanced courses in computational science and software/systems engineering. Parashar teaches electrical and computer engineering at Rutgers University. Li teaches computer science at Oklahoma State University.

QA76.59 2009-008027 978-1-60741-101-7

Mobile computing research and applications.

Title main entry. Ed. by Kevin Y. Chen and H.K. Lee. (Computer science, technology and applications)

Nova Science Publishers, ©2009 282 p. \$129.00

To open this collection, researchers at the University of Ulster outline a web-based application for diabetics to track and monitor their blood sugar levels and other statistics whether online or offline through synchronization with the Google Gears API. Other topics of the 12 papers include a dynamic vertical handoff protocol, power efficient broadcasting in wireless sensor networks, mobile database performance issues, a formal specification of requirements for safety critical applications, and fractional derivatives applied to linear systems.

QA76.59 2009-020551 978-1-60566-978-6

Multimodality in mobile computing and mobile devices; methods for adaptable usability.

Title main entry. Ed. by Stan Kurkovsky.

Information Science Reference, ©2010 384 p. \$180.00

Computer and information scientists, electrical engineers, and researchers in other technical fields describe the latest offspring of the cross between the Internet and the mobile phone, and predict the next generation ("She has her uncle Mac's color"). They cover theoretical foundations, design approaches, applications and field reports, and new directions. Specific topics include multimodal and multichannel issues in pervasive and ubiquitous computing, platform support for multimodality on mobile devices, two frameworks for the

adaptive multimodal presentation of information, exploiting multimodality for intelligent mobile access to pervasive services in cultural heritage sites, and towards multimodal mobile geographical information systems (GIS) for the elderly. References are provided at the end of each chapter, but also compiled into a common bibliography for the whole volume.

QA76.5915 2009-031090 978-1-60566-960-1

Ubiquitous and pervasive computing; concepts, methodologies, tools, and applications; 3v.

Title main entry. Ed. by Judith Symonds.

Information Science Reference, ©2010 1819 p. \$1,845.00

This three-volume reference begins at the beginning with coverage of fundamental concepts and theories and so brings newcomers to a field that likely will change how everyone lives. For the audience with more experience and knowledge, coverage in the subsequent sections is of development and design methodologies, tools and technologies, utilization and application, organizational and social implications, managerial impact, critical issues, and emerging trends. In all, some 120 contributed chapters under the editorial leadership of Symonds (Auckland U. of Technology, New Zealand) offer information pertaining to ambient intelligence, location information management, smart embedded systems, and topics relevant to architecture, healthcare, communication, risk analysis, business processes, and web-based human machine interaction. The contributors are based all over the world, and their work has been drawn together in a well-designed wide-ranging reference useful and accessible for students and professionals in the many fields that will be touched by the evolution of this technology.

QA76.758 2009-036577 978-0-07-162161-8

Software engineering best practices; lessons from successful projects in the top companies.

Jones, Capers.

McGraw-Hill, ©2010 660 p. \$75.00

Jones, who has worked in programming technology and software research and has written many other books on software, explains the need for better measurements, benchmarks, quality control, and security in software engineering. Drawing from observations of projects in about 600 companies, he shows how a combination of metrics and measurement can demonstrate effectiveness of software engineering methods, and presents 50 best practices for development, maintenance, management, sociology, risk analysis, governance, and renovation of legacy applications. He then explores software engineering 40 years in the future and technical topics such as the role of data mining, intelligent agents and search-bots, and other improvements. He also discusses ways for learning new software engineering information, curricula for engineers and personnel, different kinds of team organization and specialization, project management, requirements and design issues, programming and code development, and measuring programming productivity and quality levels. He includes

material on dealing with layoffs and downsizing, the changing economic balance between the US and other countries, and the economics of software during a recessionary period.

QA76.76 2009-037003 978-1-4398-0321-9
Enterprise-scale agile software development.

Schiel, James. (Auerbach series on applied software engineering)

CRC Press, ©2010 363 p. \$89.95

In this pick-and-choose reference for organizations attempting to convert to agile software development, Schiel, a certified Scrum trainer, draws on his experience leading the transition of a 1,400-person organization. He shows how to use Scrum as an organizational framework, and how to implement XP practices used to define how software is written and tested. Chapters are sequenced to match a typical developmental progression. The book also includes information on good development practices based on the ISO 9001 standard. A section on planning gives advice on creating the transition team and determining goals. The section on starting the transition covers budget, training, and communication plans, selecting pilot projects, and customer involvement. There is also material on monitoring progress, launching and managing Scrum teams, and product management. A companion web site contains sample presentations to support training, and sample policies and documents conforming to the regulatory framework provided in the book. Schiel is owner and CEO of a software development company.

QA76.76 2009-013183 978-1-56881-338-7
Level design; concept, theory, and practice.

Kremers, Rudolf.

A K Peters Ltd., ©2009 385 p. \$59.00 (pa)

Kremers, an experienced game designer, explores the logic behind designing video game levels that will challenge players' skills while also leaving them with a sense of reward after figuring out the tasks. The book examines how game stages serve as emotional feedback systems based on player actions within the game world, considers visual and audio aspects of the game environment, and introduces the fundamentals of storytelling, world building, puzzle theory, and artificial intelligence.

QA76.76 2009-043408 978-0-230-22244-1
Managing component-based development in global teams.

Kotlarsky, Julia and Ilan Oshri.

Palgrave Macmillan, ©2009 272 p. \$94.95

In this era of globalized e-commerce, demand has outstripped supply for software services. Kotlarsky (information systems, Warwick Business School, UK) and Oshri (strategy and technology management, Rotterdam School of Management, the Netherlands) introduce the recent trend of Globally Distributed Component-Based Development methodologies (GD CBD) such as Enterprise JavaBeans, Microsoft COOM and CORBA. Used in the automotive, electronics, and other industries, CBD

architecture is flexible, extensible, reusable, and easier to maintain than monolithic Information and Communication Technologies (ICT) structures. The authors discuss tools and team practices that they have found to be most effective in managing GD CBD projects, e.g., teleconferencing combined with e-meeting, and the theoretical framework. This valuable contribution to this emerging field includes a glossary and real-world case examples of CBD- based ICT.

QA76.76 2009-008870 978-0-470-40908-4
UML 2 semantics and applications.

Title main entry. Ed. by Kevin Lano.

John Wiley & Sons, ©2009 400 p. \$110.00

Unified Modeling Notation (UML) is a widely adopted software modeling notation that was introduced in order to solve the incompatibilities between the hundreds of modeling notations in use in the 1980s and early 1990s. While it partially solved the problem, other compatibility issues have become apparent, including the differing semantic uses of UML between different developers, the possibility that graphical UML models of a system don't correctly express the requirements and that the meaning of the models are not correctly implemented in an executable implementation of the system, and the problems of expressing models correctly after having applied a transformation in order to improve quality or refine code. A large number of semantics have been developed or proposed to deal with these issues. In this work, Lano (computer science, King's College, UK) explores and explains these issues, first introducing the UML notations considered as subjects for semantic definition<->class diagrams, state machines, interactions, use cases, OCL, and activity diagrams<-->and providing an overview of different semantic approaches and the role of semantics in contributing to the definition of UML. In the main part of the book he presents a range of semantic approaches to defining the semantics of UML models and in the final chapters he describes applications of UML semantics for verifications.

QA76.884 2009-019358 978-0-470-50094-1
Information processing by biochemical systems; neural network-type configurations.

Filo, Orna and Noah Lotan.

John Wiley & Sons, ©2010 148 p. \$69.95

Filo has been developing diagnostic imaging technologies in the medical equipment industry for over decade, and Lotan (biomedical engineering, the Technion) is trained as a chemical engineer. They describe some of the current research into how biological systems process information at the molecular level, an area that many hope to exploit when electronic medical devices have reached the limit of possible miniaturization. They consider materials, instruments, experimental and computational methods, theoretical matters and results, biochemical systems of the neural network type, experimental results of the basic system, and theoretical concerns and results for the extended basic system.

QA76.9 2009-017978 978-1-58488-820-8

Algorithms and theory of computation handbook; special topics and techniques, 2d ed.

Title main entry. Ed. by Mikhail J. Atallah and Marina Blanton. (Chapman & Hall/CRC applied algorithms and data structures series)

CRC Press, ©2010 -- p. \$119.95

The second edition of this reference for computer professionals and engineers, students, and researchers has been expanded to two volumes to incorporate a total of 21 new chapters. Offering broad coverage of algorithms and theoretical computer science, the handbook defines terms, describes major techniques and applications, and discusses research issues in the field. Some new topics covered include self-stabilizing algorithms, theories of privacy and anonymity, databases, computational games, pricing algorithms for financial derivatives, and communication networks. Atallah teaches computer science at Purdue University. Blanton teaches computer science at the University of Notre Dame.

QA76.9 2009940414 978-0-7695-3877-8

E-science; proceedings. (CD-ROM included)

International Conference on E-Science (5th: 2009: Oxford, UK)

Computer Society Press, ©2009 106 p. \$213.00 (pa)

This is a collection of 51 abbreviated versions of research papers originally presented during the Fifth IEEE International Conference on e-Science held in Oxford, United Kingdom, in December 2009. The topics varied and include bioinformatics and health, climate and earth sciences, digital repositories and data management, physical science and engineering, and arts, humanities, and social science. A CD-ROM is included.

QA76.9 2008-052172 978-1-60692-768-7

Grid technology and applications; recent developments.

Title main entry. Ed. by G.A. Gravvanis et al.

Nova Science Publishers, ©2009 303 p. \$79.00

Grid technologies bring together geographically separated computing resources to manage complex processes. The successful application of grid technologies requires expert knowledge of system capabilities, coordination of resources, and vigilant oversight. This book provides descriptions, methods, and case studies to help grid managers and application developers keep pace with hardware and software developments that affect grid capabilities. The book presents the work of nearly three dozen contributors from institutions in Canada, Europe, and Asia. Chapters are grouped into two broad sections: Algorithms and Techniques, and Methodology, Middleware, and Tools.

QA76.9 2009-028581 978-1-60566-858-1

Scalable fuzzy algorithms for data management and analysis; methods and design.

Title main entry. Ed. by Anne Laurent and Marie-Jeanne Lesot.

Information Science Reference, ©2010 444 p. \$180.00

Intended to bridge the gap between the database and machine

learning communities, this guide gathers theoretical and experimental contributions on fuzziness, scalability, and the use of fuzzy methods for very large datasets. The databases considered include data warehouses, data cubes, tabular or relational data, and different application types, such as multimedia, medical, bioinformatics, financial, semantic web, and data stream contexts. Two introductory chapters provide general overviews of fuzziness and scalability. A section on databases and queries examines methods that consider data structuring as the core of the approach. The next section looks at fuzzy approaches for extracting relevant information from large datasets to provide summaries of the whole data.

QA186 2009-021572 978-1-4398-1157-3

Fundamentals of linear systems for physical scientists and engineers.

Puri, N. N.

CRC / Taylor & Francis, ©2010 873 p. \$99.95

For engineers and physical scientists, Puri (power electronics and control systems, Rutgers U.) discusses linear systems theory from the introductory to advanced level. He introduces basic concepts of systems, signals, and their interaction in a mathematical form; linear operators and matrices from a systems perspective; ordinary differential and difference equations; complex variables for transform methods; integral transform methods and their properties; digital systems, Z-transforms, and applications; the internal structure of the system and the input-output system performance; the principles of variational calculus and the synthesis of optimal control systems; and stochastic processes and their linear systems response.

QA276 2009-033999 978-0-470-28430-8

Complex surveys; a guide to analysis using R.

Lumley, Thomas. (Wiley series in survey methodology)

John Wiley & Sons, ©2010 276 p. \$69.95 (pa)

Writing primarily for those with some experience in applied statistics in the social and health sciences, Lumley (biostatistics, U. of Washington) presents a guide to analyzing complex surveys using the open-source statistical computing program R. Because of the intended audience, he devotes more attention to graphics, regression, and two-phase designs than is typical for a survey analysis text. Individual chapters discuss basic tools; simple and stratified sampling; cluster sampling; graphics; ratios and linear regression; categorical data regression; post-stratification, raking, and calibration; two-phase sampling; missing data; and causal inference.

QA278 2009-017248 978-0-470-41169-8

Multivariate statistics; high-dimensional and large-sample approximations.

Fujikoshi, Yasunori et al. (Wiley series in probability and statistics)

John Wiley & Sons, ©2009 533 p. \$115.00

This reference explains how traditional multivariate methods can be adapted and used in the place of conventional statistical tools. It offers explanations of the basic tools and exact distributional results of multivariate statistics,

statistical methods for high-dimensional data, and bootstrap approximations from a methodological perspective. Topics also include: high-dimensional approximations of various statistics, selection of variables based on the model selection approach, and more. Chapters provide real-world applications and analyses of data. The book is intended for both graduate level course work in probability theory and as a reference for practical and theoretical statisticians. Authors are Fujikishi (emeritus, Hiroshima U.), Ulyanov (mathematical statistics, Moscow State U.), and Shimizu (emeritus, Institute of Statistical Mathematics, Japan). While extremely technical, the book is formatted in a convenient manner.

QA297 2009-031934 978-1-4398-0697-5
MATLAB with applications to engineering, physics, and finance.
 Baez-Lopez, David.

CRC Press, ©2010 412 p. \$79.95
 For new and experienced mathematics users, Baez-Lopez (computers, electronics, and mechatronics, Universidad de las Américas, Mexico) explains how to perform complex math tasks with relatively simple programs using MATLAB software. Focusing on the toolboxes for physics, finance, and engineering, he describes simple functions such as differentiation, integration, and plotting, and advanced topics like programming, producing executables, publishing results directly from MATLAB programs, and creating graphical user interfaces. He also provides examples of Simulink and its advantages for system modeling and simulation, and details the use of MATLAB in applications such as digital signal processing, chemical and food engineering, astronomy, optics, kinematics, annuities, and financial derivatives.

ASTRONOMY

QB981 2009-455375 978-3-527-40862-7
String cosmology; modern string theory concepts from the big bang to cosmic structure.

Title main entry. Ed. by Johanna Erdmenger.
Wiley-VCH, ©2009 313 p. \$200.00
 Over the past quarter century, new observations and phenomenological models have propelled cosmology forward; at the same time, once-shy string theory has been filling out as a possible candidate for a quantum theory of gravity. But some obstacles remain before The Big Untying can be consummated: theorists would like a microscopic understanding of the effective theories of the early universe, and truth to tell, the physics close to the initial singularity are still a bit obscure. Undaunted, theoretical physicists explore possible links between the field of inquiry and the fundamental theory, from the perspectives of string inflation from branes and moduli, cosmic superstrings, the cosmic microwave background as a possible probe of string theory, string gas cosmology, gauge-gravity duality, and heterotic M-theory and cosmology.

PHYSICS

QC7 2009-275918 978-0-19-954469-1
The harvest of a century; discoveries of modern physics in 100 episodes.

Brandt, Siegmund.
Oxford U. Press, ©2009 500 p. \$70.00
 Brandt (Physics, University of Siegen) looks at one hundred fundamental discoveries of physics between 1895 and 2001, including relativity, quantum mechanics, semiconductors, lasers, and the expansion of the universe. Each "episode" introduces readers to the scientists involved and the scientific background for the discovery, and then describes the groundbreaking work that was done. Episodes also include photographs of the scientist(s) and any apparatus involved, diagrams, and extensive references. Although nicely designed and very well written, this book is probably over the heads of readers who lack a good grounding in basic mathematics and physics.

QC52 2009-033347 978-0-7637-7999-3
Multiphysics modeling using COMSOL; a first principle approach. (CD-ROM included)

Pryor, Roger W.
Jones & Bartlett, ©2011 852 p. \$89.95
 COMSOL Multiphysics software is a finite element, partial differential equation tool for modeling of physical systems and devices. This book/DVD package for students, engineers, and scientists focuses on models in electrical, electronic, electromagnetic, optical, thermal physics, and biophysics areas. It introduces techniques for hands-on computer model building and solving with the COMSOL Multiphysics software, the AC/DC Module, the Heat Transfer Module, and the RF Module. The models presented are built within the context of the physical world and are explored in light of first principles analysis techniques. The DVD contains executable copies of each model and related animations. The book is for senior undergraduate and graduate students, and for scientists or engineers interested in exploring the behavior of different physical device structures through computer modeling. Pryor is a COMSOL Certified Consultant.

QC145 2009-011771 978-0-521-86025-3
Electrokinetically-driven microfluidics and nanofluidics.

Chang, Hsueh-chia and Leslie Y. Yeo.
Cambridge U. Press, ©2010 508 p. \$125.00
 Electrokinetics holds out the promise of allowing for true micro- and nanofluidic technology that doesn't require external handling procedures or large capillary pumps because electric fields are able to facilitate the actuation and manipulation of micro- and nanofluids. Chang (chemical and biomolecular engineering, U. of Notre Dame, US) and Yeo (mechanical and aerospace engineering, Monash U., Australia) describe analytical tools and demonstrative experiments for understanding the nonequilibrium and nonlinear electrokinetic phenomena associated with electrolytes and

dielectric liquids at the micro and nano scales. They review classical equilibrium electrokinetic theories, along with more recent theoretical developments; discuss electro-osmotic transport and its application to the design of DC electrokinetic pumps; and examine electrophoresis and its applications. They then switch focus to nonequilibrium electrokinetic phenomena in chapters discussing field-induced dielectric polarization, field-induced double layer polarization, dielectrophoresis, and electrorotation. Finally, they examine the linear and nonlinear electrokinetics associated with free surfaces, the concepts of electrohydrodynamic atomization and the electrospinning of polymer fibers, and electrowetting and electrokinetic bubble transport.

QC760 2009-011957 978-0-470-50203-7

Electromagnetic simulation techniques based on FDTD method.

Title main entry. Ed. by Wenhua Yu et al.

John Wiley & Sons, ©2009 206 p. \$110.00

This book offers an explanation of the finite difference time domain method (FDTD) and instruction on how to design FDTD projects. It provides step-by-step guidance on the implementation of electromagnetic simulation techniques based on FDTD methods and an understanding of the logic behind them. In addition to basic principles, the book also: presents basic concepts of parallel processing techniques and systems, illustrates practical simulation techniques with engineering applications, and offers an introduction to advanced simulation techniques. Chapters include individual reference listings and sets of problems. The book is clearly written, well organized, and amply illustrated. Authors are Yu, Yang, Liu, and Mittra (electrical engineering, Penn State U.).

QC787 2009-464267 978-3-527-40572-5

RF superconductivity; science, technology, and applications.

Padamsee, Hasan.

Wiley-VCH, ©2009 448 p. \$230.00

Padamsee (physics, Cornell U., US) is project leader of the Superconducting Radio Frequency Group, pushing accelerator technology for particle physics at the energy and luminosity frontiers. His 1998 *RF Superconductivity for Accelerators* (John Wiley & Sons) continues to be the standard text, but the changes it has played a large part in bringing about over the past decade have surpassed much of it. Rather than trying to incorporate both the old and new in a second edition, he here focuses on developments since then, and even so must be selective and representative. For example, he has no room to deal with cryomodule and cavity/cryomodule integration or feedback and low-level RF controls. Taking in turn the science, the technology, and applications, he considers such topics as new cavity geometries, multipacting and field emission, input couplers, tuners, storage rings, heavy-ion accelerators, nuclear astrophysics, and transmutation.

QC981 2009-017103 978-1-59726-567-6

Climate change science and policy.

Schneider, Stephen H. et al.

Island Press, ©2010 522 p. \$95.00 (pa)

Schneider (Woods Institute for the Environment, Stanford U.), Rosencranz (founder and former president of the environmental organization Pacific Environment), Mastrandrea (Woods Institute for the Environment, Stanford U.), and Kuntz-Durizeti (managing editor, *Climatic Change*) present 49 chapters that collectively comprise a broad survey of the science of global climate change and the policy options available for prevention and/or mitigation. Papers are presented in sections that focus on the impacts of climate change relative to species extinction, marine ecosystems, hurricanes, wildfires, tropical forests, food security, human health, and other issues; policy analysis issues such as economic impacts, integrated assessment modeling, risk perceptions and behavior, carbon taxes and trading; international considerations such as European Union climate policy, international treaties, international inequities and imbalances, and developing country perspectives; US domestic issues such as state policies, policies to stimulate corporate action, and the media and public education; and mitigation options relative to energy efficiency, renewable energy, hydrogen energy supply chains, nuclear energy, coal capture and storage, and tropical forests.

QC981 2009-930851 978-1-84844-037-1

Distributional impacts of climate change and disasters; concepts and cases.

Title main entry. Ed. by Matthias Ruth et al. (New horizons in environmental economics)

Edward Elgar Publishing, ©2009 216 p. \$100.00

While global climate change and climate change-induced natural disasters, such as stronger hurricanes or prolonged droughts, are frequently declared to be a problem for the whole world together, their economic and social impacts are of course distributed unevenly, according to the factors noted by editors Ruth (natural economics, U. of Maryland, US) and Ibararán (economics, U. Iberoamericana Puebla, Mexico) in their introduction: income levels, the age and gender structures of populations, access to information and environmental assets, social and human capital, economic capacity, institutional development, and strength of social cohesion. They present 11 papers exploring these relationships, beginning with opening materials that summarize issues of vulnerability and adapting capacity worldwide and the connections between climate change and macroeconomic performance. The remaining chapters focus in on different facets of the overall picture, including health impacts of heat; income distribution effects of greenhouse gases mitigation policies in Mexico; differential climate change impacts on cities in industrialized countries; the security challenges of climate change; and distributional effects and different types of adaptation in Germany and Indonesia.

CHEMISTRY

QD20 2009-277397 978-1-86094-986-9

Chemistry was their life; pioneering British women chemists, 1880-1949.

Rayner-Canham, Marelene F. and Geoff Rayner-Canham.

Imperial College Press, ©2008 542 p. \$85.00

Despite the old assertion that "women didn't do that sort of thing," women not only did chemistry in Britain between 1880 and 1949, but *a lot* of women were chemists during those years. The Rayner-Canhams (Physics [Marelene] and Chemistry [Geoff], Memorial University of Newfoundland) present biographies of 141 women chemists (out of the 896 known), clearly showing that British women were willing and able to break down the barriers keeping them out of chemistry. Organized mainly by university and chemistry subdiscipline, the book does much to put women back into the history of chemistry. Scholarly but eminently readable, this book will appeal to readers interested women's history and the history of science.

QD79 2009-031933 978-1-4398-0096-6
Ion-pair chromatography and related techniques.

Cecchi, Teresa. (Analytical chemistry series)
CRC / Taylor & Francis, ©2010 201 p. \$129.95
 Italian research and teaching chemist Cecchi (Camerino U. and ITIS Montani) has concentrated her attention on ion-pair chromatography, encompassing such aspects as retention modeling, zwitterions and other unusual analytes, and applications to non-separative functions. She explains that the technique, a mode of high-performance liquid chromatography, was developed to overcome the drawbacks of ionic suppression and ion exchange chromatography, and allows the separation of complex mixtures of polar, ionic, and ionogenic species. She balances between depth and breadth here as she explains recent developments and the current status of the separation method. The study could be used as a textbook, she suggests, though it is really intended for researchers.

QD262 2009-019344 978-0-470-09603-1
Dynamic combinatorial chemistry; in drug discovery, bioorganic chemistry, and materials science.

Miller, Benjamin L.
John Wiley & Sons, ©2010 265 p. \$79.95
 Editor Miller (dermatology, biomedical engineering, biochemistry, biophysics, U. of Rochester) and 17 co-authors provide a foundational overview of Dynamic Combinatorial Chemistry (DCC) and its extensive applications. The reference includes an introduction to DCC, approaches to binding in proteins and nucleic acids, molecular recognition, self-sorting, catalyst recovery, materials discovery, and analytical chemistry challenges. It is intended encourage new solutions and strategies for chemists working on structure libraries and designing compounds and materials. The book is technical but well-written, includes a substantial amount of references, and is very well illustrated.

QD262 2009-030808 978-0-470-51116-9
Linker strategies in solid-phase organic synthesis.

Title main entry. Ed. by Peter J. H. Scott.
John Wiley & Sons, ©2009 677 p. \$205.00
 Countering claims that solid-phase organic synthesis

died with its champion Robert Bruce Merrifield in 2006, scientists from North America, Europe, and China introduce the technique and the earlier traditional linker units, then explore the current state-of-the-art multifunctional linker units that are being applied in diversity-oriented synthesis, chemical genetics, focused library preparation, and other growing fields. Their topics include cyclative cleavage as a solid-phase strategy, photolabile linker units, hydrazone linker units, diversity cleavage strategies from phosphorus linkers, silicon and germanium linker units, linkers releasing olefins or cyclo-olefins by ring closing metathesis, and solid-phase radiochemistry. A final section provides tables for selecting linkers for various groups of compounds.

QD383 2008-053452 978-0-470-19343-3
Polyphosphazenes for biomedical applications.

Title main entry. Ed. by Alexander K. Andrianov.
John Wiley & Sons, ©2009 462 p. \$135.00
 For researchers, clinicians, and undergraduate and graduate students in pharmaceutical sciences and biomaterials, Andrianov, who works in the discovery and development of novel polymers for biological applications, compiles 20 chapters that review recent research in development of polyphosphazenes, an emerging class of polymers that includes macromolecules and are biocompatible, biodegradable, and bioactive. Researchers working in chemistry, infectious disease, pharmaceutical sciences, chemical engineering, virology, and other fields in North America, Europe, Asia, and Chile cover general aspects, the main synthetic approaches, rational design as it relates to biological applications, and the main representatives of biomedical polyphosphazenes. They then discuss vaccine delivery and immunomodulation, biomaterials, drug delivery systems, biodetection, and the synthetic aspects and novel molecular architectures of well-defined polyphosphazenes. Polyelectrolytes and applications in tissue engineering, surface modification, and in composite and nanofabricated materials are also detailed.

QD400 2009-013357 978-0-470-45211-0
Fluorinated heterocyclic compounds; synthesis, chemistry, and applications.

Petrov, Viacheslav A.
John Wiley & Sons, ©2009 515 p. \$125.00
 The subgroup of heterocycles was intensively developed only after World War II, and is now used in agricultural products, pharmaceuticals, and several varieties of plastic and chemicals. Organic chemists from many countries look at such topics as fluorinated three-membered ring heterocycles, five-membered nitrogen-containing species, synthesizing fluorinated sugars from fluorine-containing synthons, the synthesis and chemical transformation of six-membered aromatic heterocycles containing perfluoro-alkyl groups, and seven-membered and even larger ring-fluorinated heterocycles.

QD505 2009-455373 978-3-527-32095-0

Catalysis for sustainable energy production.

Title main entry. Ed. by Pierluigi Barbaro and Claudio Bianchini.

Wiley-VCH, ©2009 452 p. \$215.00

Contributors based mainly in Italy, but also in France, Switzerland, and Japan offer 13 articles of the latest research on various types of sustainable energy production using catalysis design. Fuel cells, hydrogen storage and production, and industrial catalysis are the broad subjects, with individual papers on topics that include photovoltaics, the use of catalysis to produce bio-diesel, electrocatalysis in water electrolysis, autothermal reforming of natural gas, production of methane and hydrogen from organic waste, and research on how to convert bioethanol cleanly into electricity. The essays are written for other researchers and graduate students and feature in-depth discussion of the state of research in the field. The papers were delivered in earlier form at the November–December 2006 workshop Catalysis of Sustainable Energy Production, held in Florence, Italy.

QD880 2009-051006 978-0-470-25557-5

Electrochemistry of functional supramolecular systems.

Title main entry. Ed. by Paola Ceroni et al. (Wiley series on electrocatalysis and electrochemistry)

John Wiley & Sons, ©2010 597 p. \$149.95

The editors (all of the U. of Bologna, Italy) present 17 chapters covering a broad range of topics in supramolecular chemistry with the goal of providing the reader “with an overview of current electrochemical research applied to multicomponent chemical systems, with particular attention to properties and functions, and to strengthen the contacts between the electrochemical community and the researchers engaged in the field of nanoscience.” Specific topics include molecular encapsulation of redox-active guests, dendritic encapsulation of redox-active units, redox-active metal-polypyridine dendrimers as light-harvesting antennae, dendrimers as multielectron storage devices, self-assembled monolayers and multilayers of electroactive thiols, electrochemistry of carbon nanoparticles, molecular devices based on fullerenes and carbon nanotubes, functional electroactive biomolecules, biohybrid electrochemical devices, and electroactive molecules and supramolecules for information processing and storage.

QD906 2009-031427 978-0-470-69961-4

NMR crystallography.

Title main entry. Ed. by Robin K. Harris et al. (EMR handbooks)

John Wiley & Sons, ©2009 504 p. \$140.00

Chemists and physicists explain techniques by which nuclear magnetic resonance imaging can provide illuminate the disposition of atoms in the unit cells of crystals, and can ferret out information about the crystal structures that is inaccessible by diffraction methods. After an introduction, they cover chemical shifts, coupling interactions, determining crystal structure, properties of the crystalline state, and applications to crystalline solids. Among specific topics are

experimental characterizations of nuclear spin interaction tensors, symmetry effects at the local level, indirect coupling and connectivity, tensor interplay, intermolecular interactions and structural motifs, and structural biology.

BIOLOGY

QH323 2009-025699 978-0-8493-2782-7

Fractals and multifractals in ecology and aquatic science.

Seuront, Laurent.

CRC Press, ©2010 344 p. \$89.95

Fractals, those intriguing geometric shapes that are composed of increasingly smaller copies of themselves can be found in mathematics, art, music, and, as Seuront (biological oceanography, Flinders U., Australia) notes, in atmospheric and oceanic turbulence. He offers a basic understanding of fractals and multifractals and how to use them when studying ecological phenomena and explores most of the data analysis methods used against a background of case studies frequently based on his own work. He explains the complex mathematical methodology in a way that lends the subject to a variety of fields, including biology and microbiology, social sciences, oceanography, geology, hydrology, ecology, and finance. The book is packed with supporting illustrations, graphs, and tables.

QH324 2009-028768 978-0-470-18093-8

Elements of computational systems biology.

Title main entry. Ed. by Huma M. Lodhi and Stephen H. Muggleton. (Bioinformatics; computational techniques and engineering)

John Wiley & Sons, ©2010 412 p. \$115.00

Aimed at researchers and scientists from the fields of biology, chemistry, mathematics, physics, and computer science interested in computational systems biology, this collection of 17 papers explores core and foundational areas of the field. The editors (both associated with the Department of Computing, Imperial College London, UK) present the papers in sections devoted to biological network modeling, biological network inference, genomics and computational systems biology, and software tools for systems biology. Specific topics include *in silico* analysis of combined therapeutics strategy for heart failure, rule-based modeling and model refinement, simulating filament dynamics in cellular systems, reconstruction of biological networks by supervised machine learning approaches, supervised inference of metabolic networks from the integration of genomic data and chemical information, analysis and control of deterministic and probabilistic Boolean networks, probabilistic methods and rate heterogeneity, the impact of whole genome *in silico* screening for nuclear receptor-binding sites in systems biology, environmental and physiological insights from microbial genome sequences, validation issues in regulatory module discovery, and computational imaging and modeling for systems biology.

QH345 2009-020581 978-1-4398-0474-2

Biopharmaceuticals in plants; toward the next century of medicine.

Hefferon, Kathleen Laura.

CRC / Taylor & Francis, ©2010 206 p. \$99.95

For students and researchers in medicine, plant science, biotechnology, crop science, natural products chemistry, and engineering, Hefferon (Human Metabolic Research Unit, Cornell U.) surveys the major aspects of the development and production of plant-made pharmaceuticals. She covers history, theory and practice of modern plant transformation techniques for both nuclear and plastid genomes, the generation of transgenic plants, the engineering of plant virus expression vectors for transient expression of vaccine proteins and other therapeutics, the role of glycosylation in the production of plant-made mammalian proteins, the basis of mucosal immunity using plant-based oral vaccines, the scale-up of plant-derived vaccine and therapeutic proteins in entire crops or large batch cell suspension cultures, the development of clinical trials, the immune response to plant-derived pharmaceuticals, and risks and biosafety.

QH438 2009-010497 978-1-60566-124-7

Symmetrical analysis techniques for genetic systems and bioinformatics; advanced patterns and applications.

Petoukhov, Sergey and Matthew He.

Medical Information Science Reference, ©2010 271 p. \$245.00

This work on matrix genetics compiles approaches to the structural analysis of genetic systems and bioinformatics. Kronecker matrix families of square matrices are applied to genetic informatics to derive the following results: new phenomenological rules of evolution of the genetic code, connections of genetic code structures to multi-dimensional algebras, and parallels with quantum computers. Material is in sections on symmetrical analysis techniques and symbolic matrices; numeric matrices of the genetic code; and algebras of genetic codes. A final section on connections with other fields looks at Fibonacci numbers, algebraic models of physiological cycles in matrix genetics, and connections between genetic matrices and the ancient Chinese prognosticator the I Ching. The book is for researchers and students in molecular genetics, bioinformatics, computer informatics, mathematical and theoretical biology, and psychophysics. Petoukhov is affiliated with the Mechanical Engineering Research Institute at the Russian Academy of Sciences, Moscow. Matthew He is professor and director of the Division of Math, Science, and Technology at Nova Southeastern University.

QH450 2009-017383 978-1-60566-685-3

Handbook of research on computational methodologies in gene regulatory networks.

Title main entry. Ed. by Sanjoy Das et al.

Medical Information Science Reference, ©medi 710 p. \$325.00

This collection introduces the different tools for decoding, modeling, and analyzing gene-gene interactions through

gene regulatory networks (GRNs). The papers on network inference shed light in how GRNs can be reverse engineered from experimental data while the heterogeneous data papers show how linear programming can be used to synthesize GRNs from multiple data sources. Three case studies walk through GRN intervention planning, mathematical modeling of the ? switch, and application of Petri net theory. Other topics include structural learning based on prior biological knowledge and microarray gene expression measurements, improved model checking techniques for state space analysis, and approaches for modeling intrinsic noise and delays. The editors are affiliated with Kansas State University and Michigan State University.

QH506 2009-455363 978-3-527-40702-6

Handbook of molecular biophysics; methods and applications.

Title main entry. Ed. by Henrik G. Bohr.

Wiley-VCH, ©2009 1033 p. \$350.00

Derived from the monumental 12-volume *Encyclopedia of Applied Physics* (2004), this single-volume reference offers a handier packaging of 28 articles pertaining to specific physics applications in the biosciences. Rather than aiming at comprehensive coverage of particular topics, the contributing authors present the latest research, including their own, thus making this reference something other than a monograph or a textbook. Arrangement of the contents is in sections on quantum mechanics methods for molecular biophysics and electronic structure calculations of biomolecules; studies of motions of biomolecules and molecular dynamics calculations; biomolecular structures and dynamics in proteins, lipids, and DNA; radiation and spectroscopy methods; neurobiophysics and ion channels; techniques for detecting molecular structures down to the single molecule level; physical effects in biomolecules and larger organic systems; and applications in medicine. Editor Bohr is based in Denmark (Danish Technical U.), as are at least a half dozen of the contributors; the rest are from the US and other European countries.

QP517 2009-025910 978-0-470-85153-1

A practical guide to scientific data analysis.

Livingstone, David.

John Wiley & Sons, ©2009 341 p. \$85.00

For scientists with little statistics background, such as chemists, biochemists, pharmacists, and biologists, Livingstone (U. of Portsmouth, UK) provides a guide to scientific data analysis that focuses on the application of mathematical and statistical techniques and the interpretation of their results. He covers the most common multivariate statistical methods for examining and exploring relationships in data, with many examples from different scientific disciplines, including the design of foods, drugs, and cosmetics, and chapters covering aspects from planning an experiment, to examining and displaying data, to constructing quantitative models. Discussion of theory is minimized. Elementary knowledge of statistics is assumed.

QP519 2009-931798 978-1-60327-320-6

Bioluminescence methods and protocols, 2d ed.

Title main entry. Ed. by Robert B. LaRossa and Christelle Douillet. (Methods in molecular biology; v.574)

Humana Press Inc., ©2009 267 p. \$99.00

The editors (both of the U. of North Carolina at Chapel Hill) present 20 chapters describing recently developed methods and protocols for the application of bioluminescence for the study of molecular biology. Examples of topics discussed include validation of bioluminescent imaging techniques, imaging vasculature and lymphatic flow in mice using quantum dots, bioluminescent imaging of transplanted islets, detection of apoptosis using cyclic luciferase in living mammals, noninvasive bioluminescent imaging of infections, real-time bioluminescence imaging of viral pathogenesis, bioluminescent monitoring of in vivo colonization and clearance dynamics by light-emitting bacteria, and novel tools for use in bioluminescence resonance energy transfer. As with other volume in the series, each chapter includes an introduction to the principles of the topic, lists of necessary materials, step-by-step laboratory protocols, and notes on troubleshooting and pitfalls.

QP624 2009-041483 978-0-470-74138-2

Batch effects and noise in microarray experiments, sources and solutions.

Title main entry. Ed. by Andreas Scherer.

John Wiley & Sons, ©2009 252 p. \$105.00

Researchers, clinicians, laboratory personnel, managers, and others responsible for gene expression studies are the expected readers as like professionals in a wide range of fields explain bias in microarray data, describe sources of technical and biological variation in such experiments and genome-wide associated studies, and suggest how to reduce bias. Many of the statistical methods they provide for reducing bias and alleviating its effects are previously unpublished. Among their topics are microarray platforms and aspects of experimental variation, aspects of technical bias, bioinformatic strategies for cDNA-microarray data processing, adjusting batch effects in microarray experiments with small sample size using empirical Bayes methods, visualizing cross-platform microarray normalization, and standard operating procedures in clinical gene expression biomarker panel development.

MEDICINE (GENERAL & PUBLIC ASPECTS)

R856 978-1-59693-400-9

Biomicrofabrication and biomicrofluidics.

Title main entry. Ed. by Jeffrey D. Zahn. (Methods in bioengineering)

Artech House, ©2010 352 p. \$129.00

Forty academics and researchers from the US, South Korea, and Singapore contribute 13 chapters describing a variety of methods used in the field of microfluidics to handle, manipulate, and/or analyze cells, particles, or biological components, such as proteins and DNA, for microdiagnostics. Coverage includes common microfabrication techniques utilized to create microfluidic devices and on-chip flow control

and mixing microsystems, on-chip electrophoresis and isoelectric focusing methods for quantitative biology, electrical methods for manipulations of droplets via electrowetting and particles via dielectrophoresis for separations and chemical reactions, methods for integrated optical characterization of microfluidic devices and for controlling chemical gradients within devices, microimmunoassay diagnostics, MicroFACS system, and microtubule motors in microfluidics. For engineers, scientists, and students. Illustrated with b&w and color diagrams and photographs.

R857 2009-015103 978-1-60741-617-3

Biosensors; properties, materials and applications.

Title main entry. Ed. by Rafael Comeaux and Pablo Novotny. (Biotechnology in agriculture, industry and medicine)

Nova Science Publishers, ©2009 390 p. \$129.00

New materials, technologies, and applications of the sensors are surveyed by researchers from both the technical and applications sides. Though by definition the sensors include biological elements and exploit biological responses to the environment, and though so far they are used primarily in medical and biological applications, there is interest in developing them for other uses as well. Among their topics are an update of biosensor use in controlling food safety, enzyme modified screen printed electrodes, properties and choice of material for microbial biosensor, fabrications and applications of electro-chemi-luminescent sensors, a yellow fluorescent variant as an intracellular iodide biosensor in thyroid cells, the human olfactory system and olfactory biosensors, and developing whole-cell biosensors harboring the carotenoid-converting reporter genes.

R857 978-1-59693-439-9

Cell-based biosensors; principles and applications.

Title main entry. Ed. by Ping Wang and Qingjun Liu. (Artech House series engineering in medicine and biology)

Artech House, ©2010 271 p. \$129.00

Eleven biomedical engineering academics and researchers from Zhejiang U., Hangzhou, China, contribute ten chapters surveying the field of cell-based biosensors from a systems engineering perspective. Designed for researchers and professionals, the text covers the development history and basic concept and knowledge of cell-based biosensors; cell culture on chips; the mechanism and models of cell-based biosensors; the microelectrode array as a cell-based biosensor designed for transferring and recording cellular action potential; the cell-based field-effect transistor sensor fabricated by semiconductor technology; proposal of a light addressable potentiometric sensor; the electric cell substrate impedance sensing; the patch clamp chip; other cell-based biosensors, such as quartz crystal microbalance, surface plasmon resonance, and immune cell-based biosensors; and developing trends. Illustrated with b&w diagrams and photographs.

R858 2009-926171 978-1-934115-63-3

Biomedical informatics.

Title main entry. Ed. by Vadim Astakhov.

Humana Press Inc., ©2009 270 p. \$99.00

Technicians and researchers from San Diego, California survey novel cyber-infrastructures that are currently under development in various biomedical centers around the world. They describe several architectures for large-scale collaboration across multiple centers, modern approaches in various areas of bioinformatics, and software challenges and strategies for overcoming them. Among specific topics are mediator infrastructure for information integration and a semantic data integration environment for biomedical research, current computational methods for prioritizing candidate regulatory polymorphisms, predicting protein structure from sequence similarity, the brain model of text animation as a data mining strategy, and single sign-on in a grid portal. The material could be helpful to practitioners working in bioinformatics or students preparing for it.

TECHNOLOGY (GENERAL)

T57 2009-025987 978-0-470-37306-4

Applied integer programming; modeling and simulation.

Chen, Der-San et al.

John Wiley & Sons, ©2010 468 p. \$115.00

Requiring only background in linear or matrix algebra, this application-oriented text covers modeling techniques, problem-solving methods, and algorithms employed in current commercial mixed integer programming (MIP) software. The first section introduces integer programming models and applications, and combinatorial optimization. Next, basic algebraic and geometric concepts of linear programming theory and network flows are reviewed. The last section outlines fundamentals of typical software systems, and describes classical and modern solution approaches. Each new concept or algorithm is illustrated with a numerical example. The book also contains 100 b&w figures, flowcharts, and simple geometric drawings to illustrate concepts. Chapter exercises are included, along with 35 pages of worked out and explained selected answers. The text can be used for a two-semester sequence in linear and integer programming at the senior or Master's level, in engineering, computer science, applied mathematics, or business programs. The book will be useful as a reference for MIP software developers and analysts. Chen is affiliated with the Department of Industrial Engineering at The University of Alabama.

T57 2009-038606 978-1-60566-192-6

Using activity domain theory for managing complex systems.

Taxén, Lars.

Information Science Reference, ©2010 317 p. \$180.00

This work offers a new approach to complex system development in general and to project management in complex systems, based on activity domain theory (ADT) and on theoretical developments of meaning construction. A preface overviews the telecommunications industry, where

ADT originated. The first two sections of the book describe the empirical background of ADT and describe theoretical roots of ADT in Marxian philosophy and activity theory. The third section conceptualizes ADT as an elaboration of activity theory. The last part of the book discusses implications of the theory in several areas, with focus on the coordination of complex systems. Coverage is intentionally balanced to appeal to action-oriented and more reflective practitioners, theoreticians with or without a practical inclination, and those who see practice and theory as two sides of the same coin. Taxén is affiliated with Linköping University in Sweden.

T58 2009-024351 978-1-4200-7821-3

Handbook of enterprise integration.

Title main entry. Ed. by Mostafa Hashem Sherif.

CRC / Taylor & Francis, ©2010 685 p. \$99.95

Interoperability has become a fairly well-used term, but it is a key concept in many industries, and certainly in designing and implementing enterprise integration projects. All elements and/or equipment in a system need to be compatible, able to communicate with each other. This book sheds light on current research and applications for a variety of professionals, from infrastructure and software engineers to system designers and project managers. It illustrates best practices in enterprise systems integration by focusing on: bringing existing systems together to improve business processes, designing and implementing systems that can adapt quickly and easily to changing needs, and establishing procedures for seamless transitions from legacy systems with as little disruption as possible. Editor Sherif (long-time AT&T professional and certified project manager) and 57 co-authors contributed to the book.

T58 2009-035472 978-1-60566-970-0

Methodological advancements in intelligent information technologies; evolutionary trends.

Title main entry. Ed. by Vijayan Sugumaran.

Information Science Reference, ©2010 373 p. \$180.00

International researchers detail recent advances in intelligent information technologies and their use in organizational environments. The first section of the book discusses issues related to intelligent agent and multiagent systems, the second section introduces semantic technologies and their applications, and the third section delves into decision support and modeling. Some specific areas explored are inference degradation in information fusion, an agent-based approach to process management in e-learning environments, a semantically enriched model for ontologies, agent-based semantic interoperability of geo-services, agile workflow for long-term processes, and semantic supplier contract monitoring and execution for DSS architecture. Sugumaran is a professor of management information systems at Oakland University, Rochester, MI.

T174 2009-288088 978-981-4241-38-0

Nanobiotechnology & nanobiosciences.

Nicolini, Claudio. (Pan Stanford series on nanobiotechnology; v.1)

World Scientific, ©2009 367 p. \$119.00

Nicolini (biophysics, U. of Genoa, Italy) defines and reviews the major areas of nanobiotechnology and nanobiosciences and their recent developments. He covers the basic principles and main applications of nanobiotechnology as an emerging field, including the status of new materials by organic and biological nanotechnology and their applications, nanoscale probes, and applications in science and health in the areas of protein crystallography, medicine, genomics, proteomics, cell science, mechanics, optics, and magnetism. The final chapter addresses applications to industry and energy. He focuses on technology that has been accomplished in his laboratory at the Nanoworld Institute in Genoa over the last eight years.

ENGINEERING (GENERAL, CIVIL)

TA166 2009-018069 978-1-4398-0991-4

Human factors in the design and evaluation of central control room operations.

Title main entry. Ed. by Neville A. Stanton et al.
CRC Press, ©2010 416 p. \$129.00

This work offers guidelines for accommodating human factors and ergonomics considerations in the design and evaluation of control rooms intended for remote and continuous operation, in industries such as defense, surveillance, resource extraction, power generation, and energy distribution. Self-contained chapters are written in a modular structure, with outlines, key points, and sections on standards, recommendations, assessment and evaluation, and examples. Some areas examined include automation, supervision, shift patterns, control room layout, alarms, human error, and safety culture. The guide includes numerous b&w figures and tables, and a few b&w photos. It will be useful for those who are involved in developing and upgrading central control rooms, and for postgraduate students. Stanton is chair of the School of Civil Engineering at the University of Southampton.

TA169 2009-018436 978-0-470-40503-1

Architecting resilient systems; accident avoidance and survival and recovery from disruptions.

Jackson, Scott. (Wiley series in systems engineering and management)

John Wiley & Sons, ©2010 297 p. \$79.95 (pa)

For students, practicing engineers, systems architects, technology managers, government agencies, and others, Jackson (systems architecting and engineering, U. of Southern California) presents a systems approach for resilience that public and private organizations can use in establishing procedures for anticipating, surviving, and recovering from disruptions like natural disasters, internal failures, and terrorist attacks. He covers prevention, averting worsening of a problem, and recovering; discusses infrastructure, culture, capabilities, governance, measuring resilience, and cost; and includes both holistic and analytical methods, with a focus on the holistic, in which systems

architecting has emphasis. Case studies of different industries from chemical facilities to commercial aircraft are included.

TA174 2009-031430 978-1-4200-7169-6

Real options in engineering design, operations, and management.

Title main entry. Ed. by Harriet Black Nembhard and Mehmet Aktan.

CRC / Taylor & Francis, ©2010 244 p. \$79.95

Eighteen international academics and researchers contribute 15 chapters synthesizing current knowledge regarding real options for engineering design, operations, and management. Coverage includes an introduction to real options; an overview of how real options came to be used as an analytical tool in engineering problems; real options in manufacturing operations; a real options framework for valuing quality improvement programs; the application of real options in outsourcing; barriers to real options adoption and use in architecture, engineering, and construction project management practice; identifying real options to improve engineering systems design; mining systems planning and design; creating real options in flexible systems, and comparing and optimizing the flexibility among alternative design solutions; and management applications of real options in the areas of workforce cross-training, sustainable product quality production, nanotechnology investments, and pharmaceutical development.

TA219 2009-013022 978-1-4200-8897-7

Mathematical methods for accident reconstruction; a forensic engineering perspective.

Franck, Harold and Darren Franck.

CRC / Taylor & Francis, ©2010 302 p. \$119.95

Harold and Darren Franck, both of Advanced Engineering Associates, have investigated hundreds of vehicle accidents over the past 25 years. Their book, based on their experiences and the basic principles of physics, explains the application of mathematics in modeling vehicle accident reconstruction for a variety of vehicles, from bicycles and motorcycles to cars and large trucks as well as construction equipment. Topics include: foundations of measurement, energy methods used in reconstruction, momentum methods, vehicle specifications, failure analysis, geometrical characteristics of highways, crash data recorders, low speed impacts, standards and protocols, and visibility, perception, and reaction. The book is intended for a technical audience.

TA354 2009-013703 978-1-4200-6556-5

Formulas for mechanical and structural shock and impact.

Szuladzinski, Gregory.

CRC / Taylor & Francis, ©2010 768 p. \$159.95

A specialist in mechanical engineering and structural mechanics, Szuladzinski worked in the US from 1966 to 1980 in aerospace, nuclear engineering, and shipbuilding; since then, he has worked in Australia applying his skills in the aerospace, railway, power, offshore, automotive, and process industries. He offers what is essentially a collection of formulas describing dynamic responses to shock loads.

inspired by Roark's classic *Formulas for Stress and Strain* presenting equations and explanatory sketches in a compact manner. Coverage includes concepts and foundations; natural frequency; simple linear and nonlinear systems; wave propagation; yield and failure criteria; impact; collision; cables and strings; beams; columns and beam-columns; plates and shells; dynamic effects of explosion; penetration and perforation; and damage, failure, and fragmentation. For engineers and other professionals who desire insight into how objects and structures respond to sudden, strong impulses that are usually of short duration.

TA355 2009-037408 978-0-07-150819-3

Harris' shock and vibration handbook, 6th ed.

Title main entry. Ed. by Allan G. Piersol and Thomas L. Paez.

McGraw-Hill, ©2010 -- p. \$150.00

Cyril Harris (then engineering, Columbia U.) was one of two editors of the 1961 first edition, and soldiered alone through edition after edition until the fifth in 2002, when he brought Piersol on board and Harris' name was added to the title. This edition is a more radical revision of the material than has gone before: several chapters on obsolete material have been dropped to make way for new techniques, all but one of the chapters whose authors have died were revised or rewritten by living authors, and most of the numerical values throughout are in customary units followed by SI units in parenthesis. What remains unchanged is the goal of providing practical guidance to working engineers and scientists actively engaged in solving shock and vibration problems.

TA403 2009-034795 978-1-4200-8272-2

The physical chemistry of materials; energy and environmental applications.

Roque-Malherbe, Rolando M. A.

CRC / Taylor & Francis, ©2010 500 p. \$149.95

Physicist Roque-Malherbe believes that a new branch of materials science has sprouted, the physical chemistry of materials, which emphasizes the study of materials that have application in chemistry, sustainable energy, and pollution abatement. He introduces the methods of synthesis and characterization and the properties and applications of adsorbents, ion exchangers, cationic conductors, catalysts, and permeable porous and dense materials. Among his specific topics are materials physics, diffusion in materials, adsorption in nanoporous materials, solid-state electrochemistry, heterogeneous catalysis and surface reactions, and membranes.

TA418 2009-000612 978-1-60692-476-1

Fatigue crack growth; mechanics, behavior, and prediction.

Title main entry. Ed. by Alphonse F. Lignelli.

Nova Science Publishers, ©2009 264 p. \$89.00

Fatigue damage is one of the most common sources of structural degradation in mechanical systems. This work presents current research on fatigue crack growth. Five chapters offer research and review studies on real-time

fatigue damage monitoring via in situ ultrasonic sensing, multiscale approaches to fatigue crack growth from the debonding of particle/ductile-matrix interfaces, advances in the numerical modeling of fatigue crack closure using finite elements, textural fractography of fatigue fractures, and a novel fractography for investigation of the fatigue fracture process in materials. Short communications review work on topics such as a fatigue behavior model for short fiberglass reinforced polyamides, and fatigue crack growth prediction in asphalt concrete materials with a damage mechanics model. Information on the editor is not given.

TA418 2009-030939 978-1-84821-170-4

Machining composite materials.

Title main entry. Ed. by J. Paulo Davim.

ISTE/Wiley, ©2010 262 p. \$120.00

Mechanical engineers review the fundamentals and describe recent developments in machining material that combine polymers, metals, and/or ceramics for modern manufacturing engineering. They cover the mechanics and modeling of machining polymer matrix composites reinforced by long fibers, the machinability of polymer matrix composites, drilling technology, abrasive water jet machining, metal matrix composites, and ceramic matrix composites.

TA654 2009-035874 978-0-470-05982-1

Smart structures; physical behaviour, mathematical modelling and applications.

Gaudenzi, Paolo.

John Wiley & Sons, ©2009 177 p. \$115.00

Understanding the physics, creating a mathematical model, and developing a numerical simulation are the steps Gaudenzi (aeronautical engineering, U. di Roma la Sapienza) goes through in his own research, and so uses them as a framework within which to present some results of research into smart structures over the past 20 years or so. After a general introduction to smart structures, he covers the mathematical modelling of piezoelectric bodies, actuation and sensing mechanisms, active composites, and applying smart structures in engineering practice. The material should be accessible to graduate students, researchers, and designers in structural and mechanical engineering.

TA664 2009-037001 978-1-4398-0175-8

Capacity and transport in contrast composite structures; asymptotic analysis and applications.

Kolpakov, A.A. and A.G. Kolpakov.

CRC Press, ©2010 321 p. \$159.95

For applied mathematicians and engineers, A.A. Kolpakov (Novosibirsk State U., Russia, and U. of Fribourg, Switzerland) and A.G. Kolpakov (Università degli Studi di Cassino, Italy, and Siberian State U. of Telecommunications and Informatics, Russia) present new and modified asymptotic methods for real-world applications in composite materials development, with a focus on the analysis of transport problems for systems of densely packed, high-contrast composite materials. They cover historical developments and

new progress in math calculations, computer techniques, finite element computer programs, and presentation of results of numerical computations, as well as discussion of asymptotic analysis of partial differential equations, the capacity of a system of closely placed bodies, and the total flux, energy, and capacity of the model. Other topics include material science, the transport of elastic properties of thin layers, highly filled contrast composites, and the analysis of effective properties of electroceramics.

TA1520 978-1-60511-155-1

Materials for nanophotonics <--> plasmonics, metamaterials, and light localization; proceedings.

Symposium on Materials for Nanophotonics (2009: San Francisco, CA) Ed. by Luca Dal Negro et al. (MRS symposium proceedings; v.1182)

Materials Research Society, ©2009 179 p. \$111.00

The 23 peer-reviewed papers address challenges in material fabrication for engineering light localization, optical dispersion, and plasmonic fields in complex optical media. Such research has the potential to boost the scaling of optical technologies below the diffraction limit, opening unprecedented opportunities for basic and applied research. Among the topics are low-energy ion beam synthesis as a new route toward plasmonic nanostructures, improved analytical models for single-layer and multi-layer silver superlenses, the effective excitation of superfocusing surface plasmons using phase controlled waveguide modes, a subwavelength terahertz waveguide using negative permeability metamaterial, large-area light propagation in quasi-zero average refractive index materials, and optimizing plasmonic nano-antennas.

TA1520 2009-035663 978-0-8194-7773-6

Tutorials in complex photonic media.

Title main entry. Ed. by Mikhail A. Noginov et al.

SPIE, ©2009 696 p. \$103.00

Recent breakthroughs in optics and photonics such as holography, optics of scattering media, and metamaterials have involved inhomogeneous, composite, and multiphase materials, whose structures are either photoinduced or determined by synthesis or fabrication. Presented by Noginov (Norfolk State U., US), Dewar (U. of North Dakota, US), McCall (Imperial College London), and Zheludev (U. of Southampton, UK), the purpose of this book is to present students and practicing engineers with tutorials in these complex photonic media, with each of the 19 chapters proceeding from basics towards discussion of more advanced topics. The chapters discuss negative refraction, negative refractive index and subwavelength imaging, magneto-optics and the Kerr effect with ferromagnetic materials, symmetry properties of nonlinear magneto-optical effects, optical magnetism in plasmonic metamaterials, chiral photonic media, optical vortices, photonic crystals, wave interference and modes in random media, chaotic behaviors of random lasers, lasing in random media, feedback in random lasers, optical metamaterials with zero loss and plasmonic nanolasers, resonance energy transfer, optics of nanostructured materials from first

principles, organic photonic materials, charge transport and optical effects in disordered organic semiconductors, holography and its applications, and slow and fast light.

TA1530 2009-455376 978-3-527-32121-6

Nanophotonics and nanofabrication.

Title main entry. Ed. by Motoichi Ohtsu.

Wiley-VCH, ©2009 259 p. \$190.00

Ohtsu (electrical engineering and information systems, U. of Tokyo, Japan) presents 11 chapters outlining the principles and practices of nanofabrication using the optical technology of nanophotonics, a technology fusing optical fields and matter that utilizes the nanometer-sized light localized on the surface of a nanometric material. Following the introductory chapter discussing the history and present status of nanophotonics and its application to nanofabrication, the second chapter presents the principles of nanofabrication based on dressed-photon models, describes adiabatic and nonadiabatic processes in nanofabrication, and demonstrates their application to chemical vapor deposition and lithography. The remaining ten chapters discuss practices of nanofabrication, including nanofabrication using self-organization and related technology to control the size and position of fabricated nanometric materials, the fabrication of semiconductor quantum dots, lithography based on nanophotonics, x-ray device fabrication using nanophotonic lithography, and periodic nanostructure formation on hard thin films using femtosecond laser ablation, among other topics.

TA1637 2009-022292 978-1-84821-139-1

Multivariate image processing.

Collet, Christophe.

ISTE/Wiley, ©2010 459 p. \$150.00

Multivariate imaging is a big family of information media that includes color imaging, multimodal data, multispectral and hyperspectral data, multidata images, heterogeneous data, multisource observations. The 14 studies here grew out of a 2005-08 research project that involved analyzing and manipulating multivariate imaging from theoretical or application motivations, emphasizing the wealth and complexity of the data, the diversity of the goals, and the variety of the methods. They cover registration and fusion, detecting change, de-noising and segmentation, and new challenges for massive multicomponent image analysis. Among specific topics are fusing satellite images at different resolutions, detecting and tracking emission rays in radio astronomy, multivariate mathematical morphology applied to color image analysis, and parallelizing image analysis applications for spectral microscopy.

TA1675 2009-009170 978-1-60692-896-7

Fiber lasers; research, technology, and applications.

Title main entry. Ed. by Masato Kimura. (Lasers and electro-optics research and technology series)

Nova Science Publishers, ©2009 225 p. \$129.00

This volume contains seven studies and four short communications on fiber lasers and their applications. An international group of contributors working in optics and

photonics, physics, applied mathematics, engineering, neuroscience, and life, chemical, and social sciences discuss multiple four-wave mixing processes; amplified femtosecond fiber lasers; the intra-cavity dynamics, possible operation modes, and performance optimization of the laser cavity; bacterial cell interactions with optical fiber surfaces; single-frequency fiber lasers; the properties of frequency modulation mode-locked lasers; the operation of passively mode-locked lasers with nonlinear optical loop mirrors; and the use of laser scanning in eye movements.

MECHANICAL ENGINEERING & MACHINERY

TJ163 2009-025318 978-1-4398-2145-9

Handbook of energy audits, 8th ed.

Thumann, Albert et al.

Fairmont Press, ©2010 492 p. \$125.00

This handbook walks through the process of planning and carrying out energy audits of electrical, mechanical, and building systems in any type of facility. It will be useful for energy engineers, non-engineers, and others new to the field of energy management. The handbook explains how to evaluate how energy is used in commercial facilities, how to establish accurate baseline information, and how to identify where energy consumption can be reduced. Topics covered in detail include energy accounting procedures, electrical, mechanical, building, and process systems analysis, life cycle costing, and maintenance management. The handbook includes example calculations and a glossary. This eighth edition covers ASHRAE Level 1 and 2 energy audits, and contains a new chapter on water conservation. The book is distributed in the US by Taylor and Francis. Thumann is executive director of the Association of Energy Engineers, and a veteran of the Bechtel Corporation.

TJ217 2009-039083 978-1-4200-7924-1

Intelligent control systems with an introduction to system of systems engineering.

Nanayakkara, Thrishantha et al. (System of systems engineering series)

CRC Press, ©2010 421 p. \$99.95

System of systems (SoS) refers to conglomerates of complex operational systems interacting among themselves to achieve a common goal. This work offers a practical review of SoS and some of its applications, integrating traditional systems control theory with discussion of fields underlying SoS engineering, such as dynamic systems, control, neuroscience, soft computing, signal processing, and systems integration. Chapters progress from elements of a classical control system and an introduction to SoS, to areas such as observer design and Kalman filtering, SoS simulation, and reward-based behavior adaptation. Two final chapters offer detailed case applications in mine detection. MATLAB code for hands-on projects can be downloaded from a web site. Nanayakkara is affiliated with the Computer Science and Artificial Intelligence Laboratory of the Massachusetts Institute of Technology.

TJ233 2009-993532 978-1-61503-012-5

Systems failure analysis.

Berk, Joseph.

ASM International, ©2009 202 p. \$90.00

With its four-step, team-oriented problem solving process for systems failure analysis, this work is intended to help product teams discover the causes of defects and failures in complex manufacturing and engineered systems. While portions of the book cover component failure mechanisms, the focus is on causes of system failure, such as complex component and subsystem interactions that don't involve failing parts. Methods discussed include Ishikawa diagrams, the 5-whys approach, and mind mapping. Three chapters are devoted to fault tree analysis. Other topics covered include mechanical and electronic failures, leaks and contaminants, design of experiments, and post-failure analysis activities. B&w photos are included. The book will be useful as a reference for professionals in engineering and quality assurance, as well as manufacturing technicians, purchasing personnel, field service personnel, and operators or other users, working in the aerospace, defense, automotive, biomedical, electronic, energy, and process industries. Berk is a member of the Mechanical Engineering, Civil Engineering, and Engineering Technology departments at the California State Polytechnic University.

ELECTRICAL ENGINEERING, ELECTRONICS, NUCLEAR ENGINEERING

TK5105 2009-021593 978-1-60566-894-9

Cases on semantic interoperability for information systems integration; practices and applications.

Title main entry. Ed. by Yannis Kalfoglou.

IGI Publishing, ©2010 350 p. \$180.00

Powerful and complex information systems have evolved over the past half century that are finely tuned to particular cultural and geographical contexts. Now that globalized business is battering down such obstructive dikes, it requires those systems to be integrated into a universal whole. Translating syntactically<-->moving an element from a place in one system to an analogous place in another system<-->is pretty easy. The hard part, the part addressed here, is to translate the meaning<-->to make sure that a transaction in one country is the same transaction in all countries. Researchers in information and computer sciences look at novel concepts for engineering semantic interoperability solutions, and domain-specific semantic interoperability practices. Among their specific topics are the ontological stance for a manufacturing scenario, streamlining semantic integration systems, semantic synchronization in business-to-business transactions, and data integration in the geospatial semantic web.

TK5105 2009-020544 978-1-60566-384-5

Handbook of research on Web 2.0, 3.0, and X.O; technologies, business, and social applications; 2v.

Title main entry. Ed. by San Murugesan.

Information Science Reference, ©2010 956 p. \$495.00
This two-volume handbook begins with acknowledgement of the 40th anniversary of the internet, the 20th anniversary of the web, and the fifth anniversary of Web 2.0. For academics, researchers, and practitioners, coverage encompasses both technological developments (and their implications) and social-cultural-commercial applications. After two overview chapters on the history and evolution of the Web (including before and beyond 2.0), another 48 contributions are arranged in sections on the following themes: web modeling and design; architecture; information search, bookmarking, and tagging; semantic analysis and semantic web; quality, trust, security, and effort estimation; educational applications; Enterprise 2.0, healthcare, finance, and other applications; and the social web<-->foundations, analysis, and visualization. Editor Murugesan is affiliated with Multimedia University, Malaysia, and with the U. of Western Sydney Australia; the long list of contributors includes representation from at least a dozen countries.

TK6570 2009-018070 978-1-4200-7777-3

RFID and sensor networks; architectures, protocols, and integrations.

Title main entry. Ed. by Yan Zhang et al. (Wireless networks and mobile communications)

CRC / Taylor & Francis, ©2010 626 p. \$99.95

Sixty-four international academics contribute 21 chapters to a technical guide for students, educators, research strategists, scientists, researchers, engineers, developers, and consultants in the field of wireless communications and networking, particularly those involved in developing radio frequency identification (RFID), wireless sensor networks (WSNs), and integrated RFID and WSNs. The text covers the fundamentals and principles of RFID, including tags, readers, middleware, security, and services; the fundamentals and principles of WSNs, including routing, medium access control, localization, clustering, mobility, security, and cross-layer optimization; and the principles and practical applications of integrated RFID and WSNs, as illustrated by examples such as smart homes, uses for in-hospital and out-of-hospital health care scenarios, and for monitoring building structures.

TK6575 2009-017251 978-0-470-12169-6

EM detection of concealed targets.

Daniels, David J. (Wiley series in microwave and optical engineering)

John Wiley & Sons, ©2010 284 p. \$120.00

This reference text provides an introduction for newcomers as well as a resource for current practitioners. It details the physics of electromagnetic (EM) detection methods, including RF, microwave, millimeter wave, and terahertz detection systems, for detecting concealed targets such as explosive devices and weapons hidden in the ground, clothing, or luggage. The techniques described are also applied to concealed targets such as stowaways or victims of natural disasters. The book is written from the perspective of the equipment designer, with emphasis on the factors that influence system performance. Coverage progresses from

basic principles to system design, with chapters on topics including the physics of propagation, antennas, nuclear quadrupole resonance, radar systems, and passive systems. Applications explored include earthquake and avalanche radar systems, land-mine detection, and through-wall radar for surveillance. Daniels is a sensor technician and consultant.

TK6575 2009-022439 978-0-89871-677-1

Fundamentals of radar imaging.

Cheney, Margaret and Brett Borden. (CBMS-NSF regional conference series in applied mathematics; 79)

SIAM, ©2009 140 p. \$59.00 (pa)

Using an intuitive rather than a rigorous approach, Cheney (mathematics, Rennselaer Polytechnic Institute) and Borden (physics, The Naval Postgraduate School) demonstrate the connection between the physics and mathematics of radar imaging in this work for mathematicians and students. Students should have background in complex analysis, the Fourier transform, the Dirac delta function, one-dimensional wave equations, linear algebra, random processes, and some physics. The first half of the book covers radar basics, with chapters on the history of radar and imaging methods, radar systems, scattering, detection of signals in noise, and the radar ambiguity function. The second half examines radar imaging, covering wave propagation in two and three dimensions, inverse synthetic-aperture radar, antennas, and related techniques. A final chapter presents open problems in waveform design, coding, ambiguity theory, and antennas. B&w and color photos and images are included. The book is for graduate students and mathematicians working in inverse problems, imaging, or electromagnetics, and for students and practitioners of electrical engineering and physics working on radar applications.

TK7867 2009-018610 978-0-470-34360-9

The foundations of signal integrity.

Huray, Paul G.

John Wiley & Sons, ©2010 339 p. \$125.00

Huray (electrical engineering, U. of South Carolina) provides a reference that explores the physical foundation of system integrity based on electromagnetic theory taken from Maxwell's Equations. The author utilizes current research from his team of industrial engineers and graduate students. Topics in this comprehensive textbook and reference include: plane electromagnetic waves, plane waves in compound media, transmission lines and waveguides, ideal models versus real-world systems, surface roughness, advanced signal integrity, and signal integrity simulations. The book would be suitable for undergraduate and junior graduate students as well as engineers in the field. While highly technical, the book is clearly written and amply illustrated.

TK7870 978-1-59693-436-8

Component reliability for electronic systems.

Bajenescu, Titu-Marius I. and Marius I. Bazu.

Artech House, ©2010 685 p. \$129.00

Moving past the days when reliability was an afterthought, this book helps electrical engineers and product developers

take reliability issues into account during the design process, with an emphasis on thermal design, and also during the whole manufacturing process. The Romanian authors describe the primary tools of failure analysis used in the semiconductor industry, illustrated by black and white photographs. The second half of the book walks through reliability tests and failure analyses for diodes, silicon power transistors, optoelectronic components, thyristors, integrated circuits, memories, microprocessors, and microsystems.

TK7871 2009-030895 978-1-4200-7290-7
Organic electronics; materials, processing, devices, and applications.

Title main entry. Ed. by Franky So.
CRC / Taylor & Francis, ©2010 567 p. \$149.95
 Invited physicists, chemists, and materials scientists and engineers who specialize in organic semiconductors address the relevant materials and processing, device physics, organic electronic devices, and applications. Among their topics are organic vapor-phase deposition, magnetic field effects in the materials and devices, the role of homolytic reactions in the intrinsic degradation of organic light-emitting diodes, vertical-type organic transistors, mixed molecular heterojunction photovoltaic cells, organic light-emitting diode materials and device architectures for full-color displays and solid-state lighting, and chemical and biological sensors.

TK7872 2009-014024 978-0-470-48781-5
Design and realizations of miniaturized fractal RF and microwave filters.

Jarry, Pierre and Jacques Beneat.
John Wiley & Sons, ©2009 194 p. \$95.00
 This guide for RF and microwave engineers and researchers, advanced graduate students, and wireless and telecommunication engineers shows how fractal iterations applied to microwave resonators lead to RF and microwave filters of reduced size, improved selectivity, and stopband rejections. It presents a technique for the design and fabrication of suspended-substrate miniaturized fractal microwave and RF filters for use in applications such as portable and cellular phones, wifi, 3G and 4G, and satellite networks. The design technique described is based on the general coupled resonators network and couple matrix technique. Although the book focuses on filters with symmetrical and asymmetrical frequency characteristics in the C, X, and Ku bands, applications to other frequency bands are also considered. The book can be used for an advanced graduate course in miniaturized RF and microwave filters, and can be used to supplement traditional courses in microwave filter design. Jarry teaches at Bordeaux University. Beneat teaches electrical and computer engineering at Norwich University.

TK7872 2009-031421 978-0-470-17082-3
Wireless sensor and actuator networks; algorithms and protocols for scalable coordination and data communication.

Title main entry. Ed. by Amiya Nayak and Ivan Stojmenovic.
John Wiley & Sons, ©2010 300 p. \$110.00

Editors Nayak (information technology and engineering, U. of Ottawa, Canada), Stojmenovic (editor, researcher, and IEEE fellow), and six co-authors use a problem-oriented approach to exploring a variety of computing and communications problems and solutions in wireless sensor and actuator networks. The reference incorporates both theory and practice in its coverage of applications and models, sensor area coverage, geographic routing in wireless sensor and actuator networks, sink mobility, location service, sensor placement, coordination in sensor, actuator, and robot networks, and more. While technical, the writing is clear, chapters include substantial reference listings, and the format is accessible. It is intended for graduate students in computer science and related fields as well as professionals in engineering, programming, and technology.

TK7895 2009-026282 978-1-84821-143-8
Communicating embedded systems; software and design; formal methods.

Title main entry. Ed. by Claude Jard and Olivier H. Roux.
ISTE/Wiley, ©2010 261 p. \$110.00
 This work examines the use of mathematically based formal methods in embedded systems that are linked with other embedded systems, and embedded systems that are connected to other local or remote communication circuit components. It describes elements of current embedded system programs, reviews new research on models and their use, and describes software tools. Chapters cover models for real-time embedded systems, timed model-checking, control and fault diagnosis of timed systems, quantitative verification of Markov chains, tools for model-checking timed systems, and tools for the analysis of hybrid models. Jard is professor at ENS Cachan Campus of Ker-Lann. Roux is assistant professor at Nantes University.

TK7895 2009-036996 978-1-4200-6784-2
Model-based design for embedded systems.

Title main entry. Ed. by Gabriela Nicolescu and Pieter J. Mosterman. (Computational analysis, synthesis, and design of dynamic models series)
CRC Press, ©2010 739 p. \$139.95
 Some involved with the process of modeling, and others working in fields where they use models, contributors explain the model-based design of a wide range of products and processes. The idea is that using a computational approach allows designers to raise the abstraction of the system's specification to a level where novel and differentiating functionalities can be captured. They consider such topics as formal performance analysis for real-time heterogeneous embedded systems, reconfigurable multicore architectures for streaming applications, and modeling and simulating mixed continuous and discrete systems.

M I N I N G E N G I N E E R I N G

TN751 978-0-7844-1067-7
Reducing brittle and fatigue failures in steel structures.
 Maranian, Peter.

Am. Society of Civil Engineers, ©2010 196 p. \$70.00 (pa)

Maranian, a structural engineer involved in investigations of the Northridge, California, earthquake of 1994 and the Kobe, Japan, earthquake of 1995. This book is based on his work and experiences in steel brittle and fatigue failures. While issues with fatigue and brittle failures have been thoroughly documented, those issues have not led to state-of-the-art design practices. This reference is intended to offer elements to consider in preventing failures and to give engineers a better picture of steel and its uses and limitations. Topics include: fracture and fatigue, steel material, connections and fabrications, demands on steel buildings, and discussion and recommendations. The book includes numerous illustrations and photographs. It will interest structural engineers and bridge construction, design, and maintenance professionals.

CHEMICAL TECHNOLOGY

TP159 2009-039567 978-1-84821-142-1

Chemical and biological microsensors; applications in fluid media.

Title main entry. Ed. by Jacques Fouletier and Pierre Fabry. *ISTE/Wiley*, ©2010 340 p. \$150.00

Fouletier and Fabry (both associated with Grenoble U., France) present 10 chapters discussing both theoretical basic concepts and current state-of-the-art developments related to sensors for ions and gaseous species in solution. Topics addressed include general features of such sensors, development and industrial requirements of chemical sensors, sensitivity and selectivity of electrochemical sensors, potentiometric sensors, amperometric sensors, biosensors and chemical sensors based upon guided optics, sensors and voltammetric probes for *in situ* monitoring of trace elements in aquatic media, chemometrics, and impedancemetric sensors.

TP248 2009-016549 978-0-470-69970-6

Click chemistry for biotechnology and materials science.

Title main entry. Ed. by Joerg Lahann.

John Wiley & Sons, ©2009 411 p. \$155.00

Lahann (U. of Michigan) has gathered an impressive team of experts to introduce the click reactions that have been successful in discovering new drugs over the last several years and outline promising applications to the synthesis of new biotechnology, polymer, and nanotechnology materials. The contributions describe approaches for conjugating proteins and peptides to polymers, generating complex macromolecular architectures via orthogonal and selective cycloadditions, fabricating alkyne and azide functionalized surfaces, and designing multifunctional network polymers. A survey of supramolecular materials prepared via click chemistry is nicely complemented by a chapter on dendrimer synthesis research efforts. Both black and white micrographs and color images are provided.

UG485 2009-011260 978-0-7546-7759-8

Digitising command and control; a human factors and ergonomics analysis of mission planning and battlespace management.

Stanton, Neville A. et al. (Human factors in defence)

Ashgate Publishing Co., ©2009 210 p. \$114.95

This book provides a human factors and ergonomics evaluation of a digital mission planning and battlespace management (MP/BM) system. It emphasizes the functions of brigade and battle group level headquarters. Topics include human factors in system design, mission planning and battlespace management, constraint analysis, hierarchical task analysis, social network analysis, SCADA analysis, and a summary with conclusions and recommendations. The book is illustrated and includes a helpful glossary. Authors are Stanton, Revell, and Rafferty (civil engineering and the environment, U. of Southampton, UK), Jenkins (automotive industry design engineer), Salmon (human factors group, Monash U., Australia), and Walker (built environment, Heriot-Watt U., Scotland).

UG593 2009-034902 978-1-60566-854-3

Net centricity and technological interoperability in organizations; perspectives and strategies.

Ghosh, Supriya.

Information Science Reference, ©2010 288 p. \$180.00

An information technology consultant in Washington, DC, Ghosh analyzes concepts that have transformed the US military recently, and explains how to apply them to business organizations as well. His account could serve as a supplementary textbook for courses on military and defense technology, as a guide for people engaged in government and commercial contracting, or as an introduction to net centricity for lay readers. The 17 chapters are intended to stand alone, each covering a discrete topic, within the larger themes of becoming net centric, transformational perspectives, configuring for net centricity, and assessing net centricity in organizations. Among specific topics are measures on interoperability, target state for defense information enterprise, storage strategy for the distributed enterprise, and the architectural assessment of the federal enterprise.

PUBLISHING, LIBRARY SCIENCE, BIBLIOGRAPHY

Z669 2009-039781 978-1-59158-826-9

Library data; empowering practice and persuasion.

Title main entry. Ed. by Darby Orcutt.

Libraries Unlimited, ©2010 302 p. \$50.00 (pa)

This collection of essays on interpreting and using library-generated data and outside data gives information on using data to inform and persuade, evaluation of monographic collections, serials and e-resources management, using data to improve teaching and learning, and emerging contexts such as data for repositories, and the influence of library homepage vocabulary on database usage. The book offers a review of literature on usage statistics in e-journal decision

making, a case study of maximizing the value of reference data, and advice on investing in electronic resources using capital budgeting. Editor Orcutt teaches in the School of Information and Library Science at North Carolina State University. Libraries Unlimited is an imprint of ABC-CLIO, LLC.

Z675 2009-040981 978-1-59158-887-0

The data deluge; can libraries cope with e-science?.

Title main entry. Ed. by Deanna B. Marcum and Gerald George.

Libraries Unlimited, ©2010 139 p. \$60.00 (pa)

Increasingly scientists pursue their craft at keyboards, pulling data from a vast network of sensors such as telescopes and weather stations and research reports from past or present wet-workers in laboratories, fields, and the like. Library

professionals here ask who will acquire, evaluate, manage, and preserve all these sets of data for as long as they are needed; who will maintain the infrastructure that makes it all possible; who will provide access points; and who will explain to these scientists how to use the system. They highly suspect that research libraries will play a large role, and that librarians had better be prepared. They begin by reviewing such aspects as an agenda for action, and academic libraries in science data set management and scholarly communication for domain sciences and engineering. Then they offer perspectives from national organizations such as the Council on Library and Information Resources, and from individual research libraries such as Johns Hopkins University. Libraries Unlimited in an imprint of ABC-CLIO, LLC. ❖

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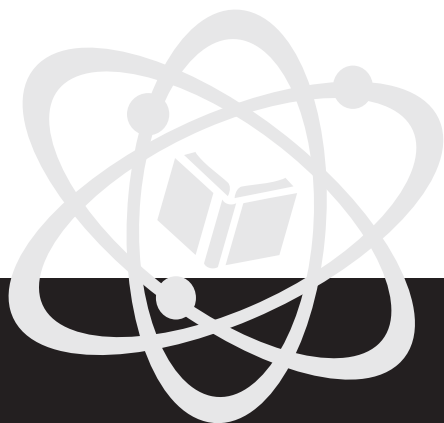
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