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The following section consists of 100 book reviews selected from *Sci-Tech Book News*, reprinted with the permission of Book News Inc. This review journal is published four times a year, each issue reviewing over 2,000 new titles in the physical and biological sciences, mathematics, engineering, computer science, technology, and agriculture. For a sample issue and subscription information, contact Book News Inc. at 5739 NE Sumner Street, Portland, OR 97218. Phone: (503)281-9230; Fax: (503)287-4485; E-mail: booknews@booknews.com.

**PSYCHOLOGY**

BF39 97898142777457
*Discovering cognitive architecture by selectively influencing mental processes.*
Schweickert, Richard et al. (Advanced series on mathematical psychology; v.4)
*World Scientific*, ©2012 420 p. $118.00
Schweickert (Purdue U.), Donald L. Fisher (U. of Massachusetts-Amherst), and Kyongje Sung (medicine, Johns Hopkins U.) describe a technique used in cognitive psychology to learn how mental processes are organized. Readers are assumed to be familiar with probability and statistics, and the later chapters use calculus. Among the topics are process schedules, selectively influencing processes in task networks, critical path models of dual tasks and locus of slack analysis, modeling with order of processing diagrams, and the selective influence of interdependent random variables.

**HYDROLOGY, OCEANOGRAPHY**

GB400 9780444534460
*Geomorphic mapping: methods and applications.*
Smith, Mike J. et al. (Developments in earth surface processes; 15)
*Elsevier*, ©2011 612 p. $205.00
This text explains the concepts, characteristics, makers and users of, and trends in, how modern geomorphological mapping can be applied to solve complex problems in land management, including landslide risk assessment, resource location, and changes in landforms. Following a historical overview of trends in field-based geomorphological mapping, Smith (geography, geology, and the environment, Kingston U., UK) and colleagues in the UK and the Netherlands present new digital tools and techniques, e.g., remote sensing, WebGIS, that have resulted in the use of ‘non-subjective’ mapping in applied research that now informs cartography, geographic information systems, and terrain analysis. The handbook includes international case studies illustrated with diagrams and color plates that exemplify the diverse applications, current limitations and potential of this methodology.

**MUSEUMS**

CD971 9781931666435
*How to manage processing in archives and special collections.*
Hackbart-Dean, Pam and Elizabeth Slomba.
*Society of American Archivists*, ©2012 147 p. $69.95 (pa)
Primarily directed at beginning archivists, and those working at colleges with limited professional staff or even a sole employee, this book includes material useful in a variety of settings. It has a strong management focus, but also gives space to adapting to standards and relatively new innovations such as Web 2.0. But the overall goal of any special collection is to provide useful material to patrons as quickly as feasible, while having in place solid protective measures--and this work never loses that focus. Written by Hackbart-Dean (Special Collections Research Center, Southern Illinois U.) and Slomba (archivist, U. of New Hampshire), it closes with a bibliographic essay on subjects like book processing costs and backlog management. An appendix providing sample forms for preparing one’s own processing work plan is also included.

**ENVIRONMENTAL SCIENCE, ECOLOGY**

GF23 9781420082876
*Statistical geoinformatics for human environment interface.*
Myers, Wayne L. and Ganapati P. Patil. (Chapman & Hall/CRC applied environmental statistics)
*CRC Press*, ©2013 213 p. $79.95
Departing from conventional concepts of both space and interface regarding human/environment, Myers and Patil (both Pennsylvania State U.-University Park) treat space as a pattern of proximities or vicinities, with the pattern being a square grid and the vicinities being centrally referenced with regard to the placement. Their topics include statistical geoinformatics of human linkage with environment, intensity images and map multimodels, semi-synchronous signals and variant vicinities, regression relations for spatial stations, and shifting spatial structure.
PRODUCTION, INDUSTRY, LABOR

HD30 9781466619692
Knowledge management innovations for interdisciplinary education; organizational applications.
Title main entry. Ed. by Sheryl Beverly Buckley and Maria Jakovljevic.
Information Science Reference, ©2013 456 p. $175.00
Nineteen papers examine the importance of knowledge transfer activities between universities and other stakeholders, link knowledge management as a field of education to innovative learning, and assess the impact of applying knowledge management on the innovation of an organization. The contributors propose a model of creativity, invention, and innovation for entrepreneurial engineers, an education-based categorization of vocational workers, and wikis as a tool for collaborative product design. Other topics include the knowledge-centric capabilities of Fundamo financial services, knowledge management processes, metrics, and innovation policies in the Israeli higher education system, and tools for communities of practice. Buckley teaches at the University of South Africa and Jakovljevic teaches at the University of Zadar.

HD62 9781466618367
Managing dynamic technology-oriented businesses; high tech organizations and workplaces.
Title main entry. Ed. by Dariusz Jemielniak and Abigail Marks.
Business Science Reference, ©2012 315 p. $175.00
International contributors in business and management investigate issues of high-tech work environments, such as managerial pressure, and seek to understand software professionals’ career identities and perceptions. One study introduces a narrative approach to technology studies and applies it to the case of a failed software project. Another study proposes a new material-discursive understanding of technology in the form of ‘material storytelling,’ while a third study uses storytelling to examine stakeholders and imaginary scenarios in the truck manufacturing industry. Other topics addressed include management of virtual teams, video game designers and unpaid overtime, gendered roles in technology-based organizations, and middle managers’ deterioration as a source of organizational decline. Jemielniak is affiliated with Kozminski University, Poland. Marks is affiliated with Heriot-Watt University, UK.

HD9661 9780857090676
Manufacturing techniques for polymer matrix composites (PMCs).
Title main entry. Ed. by Suresh G. Advani and Kuang-Ting Hsiao.
Woodhead Publishing, ©2012 497 p. $265.00
Mechanical engineers describe common and emerging processes for manufacturing materials that are composed of particles or fibers embedded in polymer matrices. They also explain the underlying physics, the corresponding models and scientific understanding, and common issues and various approaches. The topics include compression molding in polymer matrix composites, processing polymer nanocomposites, the filament winding process in thermoplastics, vacuum assisted resin transfer modeling, and autoclave processing for composites.

SCIENCE (GENERAL)

Q172 9783527409310
The complexity of dynamical systems; a multi-disciplinary perspective.
Title main entry. Ed. by Johan Dubbeldam et al.- Wiley-VCH, ©2011 246 p. $120.00
Physical scientists, engineers from a range of disciplines, and mathematicians investigate complexity from a perspective that combines statistical physics and dynamical systems research. Covering first applications then fundamental aspects, they consider such topics as long-lived transients in transitional pipe flow, symbolic dynamics in genetic oscillation patterns, monodromy and complexity in quantum systems, and synchronization on the circle.

Q180 9780470195154
Statistical and machine learning approaches for network analysis.
Title main entry. Ed. by Matthias Dehmer and Subhash C. Basak. (Wiley series in computational statistics; 707)
John Wiley & Sons, ©2012 331 p. $115.00
As the editors note in their preface, network analysis has become an emerging trend in several scientific disciplines. This work brings together a number of theoretical disciplines like graph theory, machine learning, and statistical data analysis to examine complex networks with an interdisciplinary approach using machine learning tools. Topics include a survey of computational approaches to reconstruct and partition biological networks, modeling for evolving biological networks, the structure of an evolving random bipartite graph, and network-based information synergy analysis for Alzheimer disease. The well-illustrated book includes extensive references, and while technical, the writing is direct. Editors are Dehmer (Institute for Bioinformatics and Transformational Research, U. for Health Sciences, Austria), and Basak (Natural Resources Research Institute).

Q181 9780838986196
The busy librarian’s guide to information literacy in science and engineering.
Title main entry. Ed. by Katherine O’Clair and Jeanne R. Davidson.- Am. Library Association, ©2012 143 p. $32.00 (pa)
O’Clair, the agricultural and environmental sciences librarian at California Polytechnic U., and Davidson (academic program services, Arizona State U.) offer an eight-chapter guide for librarians responsible for science,
engineering, and technology information literacy instruction to understanding and applying the Information Literacy Standards for Science and Engineering/Technology in curriculum design and instruction. Academic librarians and professors from US universities outline information literacy standards for engineering, life and health sciences, chemistry, human nutrition, patents, interdisciplinary science courses, and community colleges, and the characteristics and unique aspects of each discipline, strategies for integrating information literacy through active learning, challenges and opportunities, and information helpful to librarians without formal education or experience in the fields.

Q325 9781466619005
Diagnostic test approaches to machine learning and commonsense reasoning systems.
Title main entry. Ed. by Xenia Naidenova and Dmitry Ignatov.
Information Science Reference, ©2013 301 p. $195.00
Taking commonsense reasoning as a process of thinking that reveals causal connections between objects, their properties, and their classes, mathematicians and computer scientists--most of the them Russian--explore the role it can play in machine learning and intelligent computer systems. After setting out theoretical models of logical inference, they explore some new and original direction in artificial intelligence, machine learning, Internet data analysis, and creating intelligent computer systems. Then they demonstration applications of machine learning, knowledge elicitation, and knowledge organization in different problem domains, among them predicting new inorganic compounds and their properties, evaluating the organism’s functional state of individuals depending on their immune reactivity, and business intelligence in corporate governance.

Q325 9780769547213
Intelligent human-machine systems and cybernetics; proceedings: 2v.
In some 180 papers, selected from over 400 submitted, researchers and practitioners share findings and ideas concerning the technology. Among the topics are adaptive pinning synchronization in complex dynamical networks with a novel adaptive law, a hybrid differential evolution algorithm with opposition-based learning, a space tether net system for capturing and removing debris, a reliable scene matching approach based on the fusion feature of correlation peak, barcode recognition based on multiform algorithms, modeling the interpersonal relationship network of rumor spreading, applying fuzzy control strategy in automatic parking path planning, predicting the secondary structure of proteins using new ways of classification, and visualizing a decision-making model of four objectives based on the balance of space vector. The two volumes are paged separately, and each has its own author index.

Q325 9780470919996
Reinforcement and systemic machine learning for decision making.
Kulkarni, Parag. (IEEE series on systems science and engineering; 1) John Wiley & Sons, ©2012 285 p. $115.00
A researcher in information technology, Kulkarni specializes in machine learning, knowledge management, and systemic management. Here he sets out a new paradigm of systemic machine learning using elaborate case studies. He begins by introducing reinforcement and systemic machine learning and reviewing fundamentals of whole-system, systemic, and multi-perspective machine learning. Then he covers reinforcement learning, systemic machine learning and model, inference and information integration, adaptive learning, multi-perspective and whole-system learning, incremental learning and knowledge representation, a machine learning perspective on knowledge augmentation, and building a learning system.

MATH, COMPUTERS
QA76.585 9781118177013
Reliability and availability of cloud computing.
Bauer, Eric and Randee Adams. John Wiley & Sons, ©2012 323 p. $79.95
Cloud computing is promoted as an efficient and economical alternative to the traditional data center-based model for delivering information services to end users. Bauer and Adams, members of the Software, Solutions and Services Group of Alcatel-Lucent, define the basic terms and concepts of this new paradigm; apply analyses of risk to service reliability and availability, explain how these differ from reliability diligence for traditional applications; and make recommendations for maximizing such via virtualization and cloud deployment. They discuss budgetary aspects of moving to the cloud; a case study illustrates key architectural design points. The text includes supporting figures, tables, and equations, a list of abbreviations, and references.

QA76.59 9781466619395
Strategy, adoption, and competitive advantage of mobile services in the global economy.
Title main entry. Ed. by In Lee. Information Science Reference, ©2013 429 p. $190.00
In this work for researchers and industry practitioners, international contributors in business information systems, economics, and telecommunication engineering report on the latest research, theories, and practical experiences related to business models in mobile services. Section 1, on human factors in mobile services, examines consumers’ service
acceptance models, trust, and psychological perspectives on mobile services. Topics include adoption of mobile video-call services, and consumer adoption of mobile phones in Malaysia. Section 2 addresses user characteristics, specific technology factors, and attitudinal and behavioral perspectives on new mobile technologies. Research is presented on topics such as adoption of mobile reading devices in the book industry, and factors affecting mobile phone use among undergraduates in Turkey. Section 3 discusses business aspects of mobile services management, with chapters on topics such as mobile services as resources for consumer integration of value in a multi-channel environment, and justifying RFID investment to enable mobile service applications in manufacturing and supply chains. Lee is affiliated with Western Illinois University.

QA76.76 9780132810135
**Disciplined agile delivery: a practitioner's guide to agile software delivery in the enterprise.**
Ambler, Scott W. and Mark Lines. IBM Press, ©2012 513 p. $54.99 (pa)
This guide for agile practitioners and senior IT managers explains how to use IBM's Disciplined Agile Delivery (DAD) process framework for implementing agile practices in large, complex IT projects. The book outlines an end-to-end agile delivery lifecycle, describes common agile practices and how they fit into the lifecycle, and offers insight on how agile teams work in the overall enterprise. The first two sections introduce DAD and set out DAD team roles and responsibilities. The next three sections follow a DAD project from initiation to release; each of these sections includes a case study. A final section addresses DAD in the enterprise. The guide contains numerous bullet points, summary tables, key point boxes, and process diagrams. Ambler is an agile consultant and Lines is an agile coach. The authors are moderators of the DAD community website.

QA76.76 9781439876626
**Effective methods for software and systems integration.**
Summers, Boyd L. CRC Press, ©2012 163 p. $99.95
Summers, a software engineer for an aerospace company, explains how to select and apply a software development life cycle that promotes effective and efficient software and systems integration in military and aerospace programs and software industries. He explains program and project planning; systems design; software requirements, design, implementation, and integration; software and systems integration and delivery; subcontractor roles and responsibilities; and product evaluation.

QA76.76 9780471751601
**Mobile agents in networking and distributed computing.**
Title main entry. Ed. by Jiannong Cao and Sajal K. Das. (Wiley series in agent technology; 3)

**John Wiley & Sons, ©2012 331 p. $79.95**
Contributors whose fields are not identified investigate how mobile agents can be used to simplify development and improve system performance in networking and distributed computing applications. They cover principles of applying mobile agents, techniques and applications based on them, and design and evaluation. Among specific topics are mobile agent communications, distributed security algorithms for mobile agents, network routing, resource and service discovery, distributed databases and transaction processing, and evaluating the performance of mobile agent platforms and comparison with client-server technologies.

QA76.76 9781466608979
**Software reuse in the emerging cloud computing era.**
The 12 papers in this collection describe different approaches for reusing software across multiple architectures, platforms, services, and cloud applications. The opening chapters propose techniques for migrating a legacy system to the cloud and a model expansion method for evolving hierarchically composed designs with model composition graph schema. Other contributions explain the benefits of cloud computing, challenges to adopting a service-oriented architecture, transaction models for dependable cloud computing, and tools for social customer relationship management.

QA76.9 9781614990499
**Agents and ambient intelligence: achievements and challenges in the intersection of agent technology and ambient intelligence.**
Title main entry. Ed. by Tibor Bosse. (Ambient intelligence and smart environments; v.12)
*IOS Press*, ©2012 329 p. $145.00
Editor Tibor Bosse (VU University Amsterdam, The Netherlands) points out in the preface that the concepts of intelligent agents and of ambient intelligence have evolved in parallel, and yet these two areas have many overlapping components that invite combined study. This volume presents 12 contributions pertaining to the development of agent-based ambient intelligent systems. Arrangement is in four thematic sections on ethical and philosophical issues, methods for development, efforts toward more intelligent and adaptive systems, and applications of agent-based AmI systems. More specifically, chapters address multi-agent based social simulation applied to validation of location services, automated activity interventions to assist with activities of daily living, an access-control agent-based security system, and a multi-agent humor-equipped conversational system, among other topics.
The days of enterprises/organizations depending on a single, closed database have given way to a Web-dominated world in which multiple databases must interoperate and integrate. Doan (computer science, U. of Wisconsin, Madison) and colleagues at Google and the University of Pennsylvania address how database ideas have broadened to accommodate external sources of structured information, distributed aspects of the Web, and issues of data-sharing. Part I treats topics and techniques for data queries, integration, and warehousing covered in a database course. Part II discusses extended data representations that capture properties not present in the standard relational data model. Then they present novel architectures for, and trends in, addressing specific integration problems, e.g., of Web sources. Includes an extensive bibliography.

Biostatisticians and related researchers describe time-to-event interval-censored analysis methods and their applications. Their topics include various models for interval-censored data, regression analysis for current status data, Bayesian inference of interval-censored survival data, adaptive decision making based on interval-censored data in a clinical trial to optimize the rapid treatment of stroke, and practical issues on using weighted logrank tests.

Liu (Uniformed Services U. of the Health Sciences and Walter Reed National Military Medical Center) introduces many specialized facets of survival analysis, drawing on his own multidisciplinary background to sample applications in medicine, biostatistics, demography, mathematical biology, sociology, and epidemiology. He leans heavily on the celebrated Cox model, using it in almost all the applications. Professionals, academicians, and graduate students who have some prior experience in survival analysis might benefit from the descriptions of concrete applications.

Zhou (computer science and technology, Nanjing U., China) notes in his introduction that a primary task of machine learning, pattern recognition and data mining is to develop good models from data sets. He provides details of this topic and more in his discussions, including basics for readers unfamiliar with machine learning, ensemble techniques such as combination methods and diversity as well as boosting and bagging, ensemble pruning, and a number of advanced topics. Each chapter contains suggested additional reading and references are extensive.
(who has taught optical engineering in the CALTECH applied physics and aeronautics departments for many years) presents the theoretical background needed to understand how optical systems for the latest telescopes and instruments are designed and built. Topics include area comparison of ground and space measurements, image formation, and interferometry. The text contains explanatory figures, equations, and photographs.

QB462 9781583818008
Numerical modeling of space plasma flows; proceedings.
Astronomical Soc./Pacific, ©2011 381 p. $77.00
Scientists from different branches of the plasma simulation community explore a wide range of research topics, all of which are essential for performing high-resolution simulations of physical phenomena in space physics and astrophysics. The 57 papers discuss such topics as software packages for modeling and analyzing plasma flows; advanced numerical methods for space, astrophysical, and geophysical flows; large-scale fluid-based, kinetic, and hybrid simulations; turbulence and cosmic ray transport; and magneto-hydrodynamics. Among the applications are cosmology and galaxy formation, supernova explosions, and the interstellar medium and star formation. There is no subject index.

QB791 9783110258547
Paths to dark energy; theory and observation.
Byrd, Gene et al. (De Gruyter studies in mathematical physics; 2)
De Gruyter, ©2012 403 p. $154.00
A team of four astronomers present an overview of the observations and theory of dark energy. They do not suppose advanced knowledge of astronomy, so present basic mathematical concepts used on modern cosmology in a simple but rigorous way. Dark energy is generally studied in the very large scale universe, but they show how its effects can also be detected in smaller systems. Their topics include tests of general relativity, finite versus infinite universe in space and time, dark energy discovered, baryonic matter, and cosmological inflation.

PHYSICS

QC174 9789814316392
Applied Bohmian mechanics; from nanoscale systems to cosmology.
Title main entry. Ed. by Xavier Oriols and Jordi Mompart.
Pan Stanford Publishing, ©2012 566 p. $149.95
Bohmian mechanics explains quantum phenomena in terms of point particles guided by waves; the notion is that one object cannot be a wave and a particle simultaneously, but two can by splitting the task. Louis de Broglie posited the idea then dropped it, but David Bohm picked it up during the 1950s, dusted it off, and showed that Bohmian (not Broglian!) mechanics agrees with all quantum experiments done up to now. The theory is little known, but the mathematics are simple for anyone with a basic knowledge of classical and quantum mechanics. In this volume, physicists begin with an overview of the theory, but then focus on practical applications. The topics include hydrogen photo-ionization with strong lasers, the role of trajectories in quantum chemistry and chemical physics, beyond the eikonal approximation in classic optics and quantum physics, and a subquantum accelerating universe. Distributed in North America by CRC Press.

QC176 9781605113296
Titanium dioxide nanomaterials; proceedings.
Symposium GG, “Titanium Dioxide Nanomaterials” (2011: San Francisco, CA) Ed. by Xiaobo Chen et al. (Materials Research Society symposium proceedings; v.1352)
Materials Research Society, ©2012 159 p. $113.00
The synthesis, properties, and applications of the materials are examined in 22 papers selected from more than 160 presentations. The invited papers discuss (green) photocatalytic synthesis employing nitroaromatic compounds, and the photodeposition of metal sulfide quantum dots on titanium (IV) dioxide and its applications. Other topics include a first-principles study of oxygen deficiency in rutile titanium dioxide, fabricating three-dimensionally ordered macroporous and mesoporous titania monoliths by a dual-templating approach, the ellipsometric characterization of thin nanocomposite films with tunable refractive index for biochemical sensors, rational designs with nanocomposites based on titanium dioxide for solar photocatalytic purification, and high efficiency front-illuminated nanotube-based dye-sensitive solar cells. Co-published with Cambridge University Press.
**Quantum optics with semiconductor nanostructures.**

Title main entry. Ed. by Frank Jahnke. (Woodhead Publishing series in electronic and optical materials; no. 28)

_Woodhead Publishing_, ©2012 577 p. $290.00

The two fields of quantum optics and semiconductor nanostructures were both successful on their own, but their merging has also become an important research area. Here physicists describe recent developments in single quantum dot systems, nanolasers with quantum dot emitters, interaction between light and matter in semiconductor nanostructures, semiconductor cavity quantum electrodynamics, and ultrafast phenomena. Among the topics are quantum optics with single quantum dots in photonic crystal cavities, emission properties of photonic crystal nanolasers, photon statistics and entanglement in phonon-assisted quantum light emission from semiconductor quantum dot systems, all-solid-state quantum optics employing quantum dots in photonic crystals, fmenosecond quantum optics with semiconductor nanostructures, and coherent optoelectronics with quantum dots.

**Vibrational spectroscopy in diagnosis and screening.**

Title main entry. Ed. by Feride Severcan and Parvez I. Haris. (Advances in biomedical spectroscopy; v.6)

_IOS Press_, ©2012 421 p. $218.00

For scientists and graduate students in academia and industry, Severcan (biology, Middle East Technical U., Turkey) and Haris (health and life sciences, De Montfort U., UK) compile 15 chapters that detail recent developments in the application of vibrational spectroscopic techniques—Fourier transform infrared, near infrared, Terahertz, and Raman spectroscopy—in the diagnosis and screening of pathological conditions by monitoring molecular changes in a sensitive, rapid, and automated manner. After a chapter on historical background and application trends, scientists working in biology, public health, chemistry, biomedical engineering, and related fields in Europe, the US, and Canada discuss the background to methodological approaches from experimental to computational analysis in vibrational spectroscopy and microspectroscopy; the analysis of protein structure and the screening of proteins in cells and tissues; the characterization of single molecules in complex biological fluids; uses in neurodegenerative protein-misfolding diseases like prion, Alzheimer’s, Parkinson’s, and Huntington’s diseases; the characterization of stem cells; applications in the diagnosis and screening of cancer and diabetes, in imaging breast cells and tissues, and the characterization of bone, cartilage, and dental tissues; and uses in aquatic environments, forensic research, and feed and food quality.

**Digital color imaging.**

Title main entry. Ed. by Christine Fernandez-Maloigne et al.

_ISTE/Wiley_, ©2012 352 p. $145.00

Fernandez-Maloigne (U. of Poitiers, France) et al. assemble nine chapters on recent developments in the field of automatic processing and analysis of digital color images, for researchers and students. Scientists working in France address topics in computational color imaging such as color filtering and segmentation, image regularization, linear prediction, region segmentation, color texture characterization, color invariants for object recognition, and color and motion analysis.

**Solar and infrared radiation measurements.**

Vignola, Frank et al. (Energy and the environment)

_CRC Press_, ©2012 394 p. $119.95

Physicists Vignola (U. of Oregon) and Joseph Michalsky (US National Oceanic and Atmospheric Administration--NOAA), and aerospace engineer Thomas Stoffel (US Department of Energy) explain that the obscure science of measuring solar and infrared radiation has suddenly become quite important to the renewable energy and climate change research communities. By happy coincidence, recent changes in radiometry, measurement systems, and information dissemination make an updated guide timely. They provide information to professionals in the field and students about to enter it on such matters as solar resource definitions and terminology, diffuse irradiance, rotating shadowband radiometers, infrared measurements, and setting up a solar monitoring station. A battery of appendices contain technical data and identify resources.

**CHEMISTRY**

**Chemoinformatics; advanced control & computational techniques.**

Title main entry. Ed. by Hossein G. Gilani et al.

_Apple Academic Press_, ©2013 204 p. $119.95

Writing for academics, researchers, and practicing engineers, chemical and mechanical engineers explain computational techniques used to process chemical and biological structured data. In some cases they introduce new techniques, and in others reveal novel applications of existing methods. Among the topics are a mathematical model to control the liquid-liquid equilibrium data, potential applications of artificial neural networks for thermodynamics, controlling the liquid membrane separation process, a mathematical approach to controlling the water content of sour gas, and optimizing and controlling the laboratory production of ethanol. Distributed in the US by CRC Press, a member of the Taylor & Francis Group.
Molecular fluorescence; principles and applications.
Valeur, Bernard and Mário Nuno Berberan-Santos. Wiley-VCH, ©2012 569 p. $185.00
Physical chemists Valeur (emeritus, Conservatoire National des Arts et Métiers, Paris) and Berberan-Santos (Instituto Superior Técnico, Lisbon) offer students and researchers a guide to molecular fluorescence as an analytical tool, with particular reference to applications in physical, chemical, material, biological, and medical sciences. Looking in turn at principles, techniques, and applications, they consider such topics as characteristics of fluorescence emission, environmental effects on fluorescence emission, excitation energy transfer, time-resolved fluorescence techniques, evaluating local physical parameters with fluorescent probes, and autofluorescence and fluorescence labeling in biology and medicine. The first edition was published in 2002.

VCD spectroscopy for organic chemists.
Stephens, Philip J. et al. CRC Press, ©2012 360 p. $149.95
Stephens, Frank J. Devlin (both U. of Southern California), and James R. Cheeseman, with a Connecticut company, explain how vibrational circular dichroism (VCD) can be used to determine the chiral state of molecules, which is important to organic chemists and pharmaceutical chemists. They cover the experimental measurement of vibrational absorption and vibrational circular dichroism spectra, the theory of infrared and VCD spectra, ab initio methods, conformational analysis, analyzing the infrared and VCD spectra of conformally rigid molecules, and applying VCD spectroscopy to organic chemistry.

Supramolecular chemistry of fullerenes and carbon nanotubes.
Title main entry. Ed. by Nazario Martin and Jean-François Nierengarten. Wiley-VCH, ©2012 403 p. $165.00
Twenty-five years after the awarding of the 1987 Nobel Prize in Chemistry to three developers of supramolecular chemistry, this volume presents 14 chapters covering important developments in the hybrid field of supramolecular/fullerene research. Coverage encompasses carbon nanostructures, hydrogen-bonded fullerene assemblies, receptors for pristine fullerenes, biomimetic motifs toward the construction of artificial reaction centers, fullerene-containing micelles and gels, fullerenes on solid surfaces, carbon nanotubes, and experimental determination of association constants involving fullerenes, among other topics. The two editors are affiliated as follows: Nazario Martin (University Complutense of Madrid, Spain) and Jean-François Nierengarten (University of Strasbourg, France).

Modern gold catalyzed synthesis.
In addition to all the properties that have made gold valuable in centuries past, scientists have now discovered that it can play a crucial role as a catalyst in chemical reactions. Chemists survey some of the reactions, emphasizing homogeneous reactions, but also including some heterogeneous ones. Among the topics are the hydrochlorination of acetylene catalyzed by gold, gold-alkyne complexes, gold-catalyzed aldol and related reactions, gold-catalyzed oxygen-atom transfer to alkynes, and applications of gold-catalyzed reactions to natural product synthesis.

Aryl diazonium salts; new coupling agents in polymer and surface science.
Title main entry. Ed. by Mohamed Mehdi Chehimi. Wiley-VCH, ©2012 335 p. $185.00
The salts are used in the synthesis of a large series of organic compounds, so much has been written about them. However, there has been little study of their surface and intersurface chemistry despite the growing interest in surface chemistry generally. Here, chemists and related scientists begin to fill that gap by exploring such aspects as attaching organic layers to material surfaces by reducing diazonium salts, analytical methods for characterizing aryl layers, electrografting conductive oligomers and polymers, electronic properties of silicon surfaces modified by aryl diazonium compounds, and various electrochemical strategies for grafting electronic functional molecules to silicon.
Advancing theory for kinetics and dynamics of complex, many-dimensional systems; clusters and proteins.

Title main entry. Ed. by Tamiki Komatsuzaki et al. (Advances in chemical physics; v.145)

John Wiley & Sons, ©2011 252 p. $195.00

The simple molecular dynamics used to describe small molecules and chemical kinetics prove insufficient when applied to larger, complex molecules such as those found in biology or nanoscale materials. Japanese and US molecular biologists, chemists, and physicists present some of the theoretical and computational methods that have been developed recently to address the challenge. They discuss non-Markovian theory of vibrational energy relaxation and its applications to biomolecular systems; basic concepts and computational methodologies of protein functional motions; non-Brownian phase space dynamics of molecules, the nature of their vibrational states, and non-RRKM (Rice-Ramsperger-Kassel-Marcus) kinetics; dynamical reaction theory based on geometric structures in phase space; and ergodic problems for real complex systems in chemical physics.

Natural polymers, biopolymers, biomaterials, and their composites, blends and IPNs.

Title main entry. Ed. by Sabu Thomas et al. (Advances in materials science; v.2)

Apple Academic Press, ©2013 422 p. $149.95

Chemists, materials scientists and engineers, and other researchers report recent findings regarding polymeric biomaterials, including interpenetrating polymer networks (IPM), a form in which two or more networks are at least partially interlaced but not covalently bonded. Their topics include maize-natural fiber as reinforcement with polymers for structural applications, jute/polyester composites, spider-silk production and biomedical applications, synthesizing and characterizing alkyd resin microcapsules, and environmental recovery by magnetic nanocomposites based on castor oil. Distributed in the US by CRC Press.

Integrated biomaterials for biomedical technology.


For students, researchers, scholars, and industrial experts working in biomaterials, stem cells, and tissue engineering, Ramalingam (biomaterials and tissue engineering, U. of Strasbourg, France) et al. compile 12 chapters on all aspects of biomaterials that have a wide range of biomedical applications such as medical implants and devices, stem cell and tissue engineering, protein and drug delivery, and regenerative medicine. They focus on the basic science involved in materials in biomedical technology and their structure and properties, techniques and technological innovations in material processing and characterizations, and applications. Specialists in biomaterials in the US, Asia, and Europe address different types of nanobiomaterials, how to generate porous biomaterials for tissue engineering, calcium phosphate-based biomaterials intended for mineralized tissue regenerative applications, the nanocrystalline form of calcium phosphates, the design and fabrication of silicon dioxide nanoparticles, new kinds of titanium alloy implants, an injectable growth factor system based on bone morphogenetic proteins, impedance sensing of biological processes in mammalian cells, hydrogels-based implantable glucose sensors, the molecular design of multifunctional polymers for gene transfection, hydrogels and their potential biomedical applications, and hybrid biomaterials with high mechanical and biological properties.

Biomaterials science; an integrated clinical and engineering approach.

Title main entry. Ed. by Yitzhak Rosen.

CRC Press, ©2012 309 p. $149.95

Like Rosen himself, many of the contributors are researchers with the Institute of Soldier Nanotechnologies at the Massachusetts Institute of Technology. Others are in obstetrics, and gynecology, orthopedic surgery, and other medical specialties at various universities. This book differs from others on biomaterials by emphasizing an integrated clinical and engineering approach Among the topics are principles of clinical and engineering integration in hemocompatibility, nanoparticles for cross biological barriers, neurosurgical applications of materials science, biomaterials in obstetrics.
and gynecology, and tissue engineering in the musculoskeletal system.

R857 9781926895178
_Nanomedicine and drug delivery._
Title main entry. Ed. by Mathew Sebastian et al. (Advances in nanoscience and nanotechnology; v.1)
_Apple Academic Press, ©2013 300 p. $149.95_
In this first volume of a new series, international contributors in nanobiology, applied physics, biochemistry, and clinical pharmacology shed light on recent advances in nanomedicine and drug delivery. Covering the promise and potential of nanomedicine as well as possible dangers, they consider the full range of nanomedical applications which employ molecular nanotechnology inside the human body. Some specific topics examined include colloidal delivery systems for phytochemicals, nanoparticles as adjuvants for mucosal vaccine delivery, and biosynthesis of silver nanoparticles and their antimicrobial activity. Other subjects are gold peptide nanoparticle activation of macrophages, capsules based on lipid vesicles, and effects of intranasal interferon-alpha on rat behavior. The book includes b&w images and illustrations. Sebastian is affiliated with the Ayurveda and Vein Clinic, Austria. The book is distributed in the US by CRC Press, a Taylor & Francis Group.

**TECHNOLOGY (GENERAL)**

T14 9781439870198
_Advances in social and organizational factors._
Title main entry. Ed. by Peter Vink.- (Advances in human factors and ergonomics series-)
_CRC Press, ©2012 825 p. $79.95_
Engineers in a number of fields address issues that have been identified as the greatest challenges for the near future. They cover the perception and design of spaces; ergonomics in industrial quality; human factors in terrorism; enterprise information and communication technology and work; learning and training; flexible work forces and work schedule; adapting for special groups; ship design; changes at the organizational level; new ways of work; and user experience, comfort, and emotion. Only the authors are indexed.

T50 9781439855980
_Measuring shape._
Neal, F. Brent and John C. Russ.
_CRC Press, ©2012 420 p. $139.95_
Neal (materials science researcher, Milliken Research) and Russ (image analysis consultant and trainer) offer a handbook on the practical applications of shape measurement. They address a broad range of topics, including the meanings of shape, the role of computers, two-dimensional measurements, three-dimensional shapes, and classification, comparison, and correlation. The book is amply illustrated and includes numerous examples in addition to applications. It will interest readers involved in industrial quality control, research, security, and related fields.

T55 9781466506923
_Safety and human error in engineering systems._
Dhillon, B. S.
_CRC Press, ©2013 242 p. $99.95_
Because engineering systems are such an important component of the world economy, their safety and failure have become more important than ever in light of the growing number of accidental deaths and their associated cost. Dhillon (engineering management, U. of Ottawa, Canada) explains in his preface. The author’s intent is to combine discussions of both safety and human error into a single definitive source of information. A chapter on mathematical concepts needed to understand the material is included, but the book is written in such a way that a reader with no previous knowledge will be able to comprehend the contents. A few topics include transportation systems safety, methods for performing safety and human error analysis in engineering systems, mining equipment safety, and human error in healthcare systems and mining equipment. Chapters include problems and references.

T58 9781118100349
_Service-learning in computer and information sciences; practical applications in engineering education._
Title main entry. Ed. by Brian A. Nejmeh.
_Wiley-IEEE Press, ©2012 572 p. $115.00 (pa)_
Service-learning is a pedagogical model that actively integrates community service with learning outcomes in a credit-bearing academy course or co-curricular project. It has rarely been used in the computer and information sciences, but it is the purpose of this volume to help change that. Contributors from those disciplines and other scientific and technical fields provide a framework, organizational and pedagogical models and approaches, case studies of service-learning projects, and lessons learned. Among the topics are The Humanitarian Free and Open-Source Software Project, service learning and project management, a computer literacy service-learning project in Brazil, leveraging local resources to implement community-oriented sustainable computer education projects in Los Angeles, educational impacts of an international service-learning design projects on project members and their peers, and asking whether the community partner is satisfied.

T174 9781466509542
_Microelectronics to nanoelectronics; materials, devices & manufacturability._
Title main entry. Ed. by Anupama B. Kaul.-
_Taylor & Francis, ©2013 407 p. $139.95_
Electrical and mechanical engineers and physicists survey technology at micrometer and nanometer scales, some of it still in early research and some already in commercial production. The topics include scaling and radiation effects in silicon transistors, silicon micro-electro-
mechanical resonators for timing applications, nanoscale electro-mechanical devices enabled by nanowire structures, viral-templated materials and devices, the heterogeneous integration of carbon nanotubes on complementary metal oxide semiconductor circuitry and sensing applications, and nanoscale effects in multiphase flows and heat transfer.

**ENGINEERING (GENERAL, CIVIL)**

TA166 9781439870310

*Advances in applied human modeling and simulation.*

Title main entry. Ed. by Vincent G. Duffy.- (Advances in human factors and ergonomics series-) *CRC Press, ©2012 566 p. $79.95*

Researchers in ergonomics and various fields of engineering set out models and simulations of humans that can be dropped into various studies. They cover human model fidelity and sensitivity; problem solving applications; information processing and intelligent agents; human surface scan, data processing, and shape modeling; student models in adaptive modern instructional settings; developments in modeling for user-centered design; validation for human interaction in various consumer, ground transport, and space vehicle applications; cognitive and social aspects: modeling, monitoring, decision, and response; and new methods and modeling in future applications.

TA168 9781848213630

*Industrial use of formal methods; formal verification.*

Title main entry. Ed. by Jean-Louis Boulanger. *ISTE/Wiley, ©2012 298 p. $145.00*

French, British, and Brazilian scholars explain formal analysis programming techniques that let developers analyze behavior of a software application that can deal with huge commercial software projects. They cover SPARK: a language and tool set for high-integrity software development, automatically generating test cases using the Markov chain model, analyzing the safety of embedded systems with the AlfaRica approach, Polyspace, Escher Verification Studio Perfect Developer and Escher C Verifier, partial applications of formal methods, and Event-B and Rodin.

TA340 9780470688694

*Monitoring and control of information-poor systems; an approach based on fuzzy relational models.*

Dexter, Arthur L. *John Wiley & Sons, ©2012 313 p. $140.00*

In a book that is suitable for a graduate course or for practicing control engineers, Dexter (engineering science, U. of Oxford) describes an approach to monitoring and controlling information-poor systems that is based on fuzzy relational models that generate fuzzy outputs. He covers information-poor systems from the perspectives of analyzing their behavior, control, online learning, and some example applications.

The topics include describing and propagating uncertainty, accounting for modeling errors in fuzzy models, incorporating fuzzy inputs, adaptive model-based and model-free control, controlling thermal comfort, and measuring spatially distributed quantities.

TA409 9783527333578

*Refinery engineering; integrated process modeling and optimization.*

Chang, Ai-Fu et al. *Wiley-VCH, ©2012 497 p. $120.00 (pa)*

Citing a growing tide of retiring industry professionals and the prohibitive costs of test runs, Chang (Chevron Phillips Chemical Company), Pashikanti (Chevron Phillips Chemical Company) and Liu (chemical engineering, Virginia Polytechnic Institute and State U.) note a need for readily reproducible methods of modeling and optimization of petroleum refinery processes. To that end, they present a methodology using the commercial software tool Aspen HYSYS from Aspen Technology (although other process simulation software or custom software can also be used) for the integrated modeling and optimization of key reaction and fractionation processes in the modern refinery. They address catalytic reaction processes, such as fluid catalytic cracking, catalytic reforming, and hydrotreating, together with upstream fractionation units, such as atmospheric distillation unit and vacuum distillation unit, as well as downstream fractionation units following the catalytic reaction processes.

TA417 9781439836637

*Ultrasound and electromagnetic NDE for structure and material characterization; engineering and biomedical applications.*

Title main entry. Ed. by Tribikram Kundu. *CRC Press, ©2012 875 p. $149.95*

Most books on non-destructive evaluation (NDE) are either elementary explanations of the fundamental equation derivatives or advanced descriptions of specialized applications. A 2004 book covered both, but is now out of date; many of the mechanical and other engineers who contributed to that one return here. Both newcomers and old hands should find helpful information. The topics include the mechanics of elastic waves and ultrasonic nondestructive evaluation, guided waves for plate and pipe inspection, characterizing materials with nonlinear ultrasonic techniques, the theory and applications of scanning acoustic microscopy and scanning near-field acoustic imaging, and fiber-optic sensors for monitoring structural health.

TA418 9781439854150

*Characterization of nanostructures.*

Myhra, Sverre and John C. Rivière. *CRC Press, ©2013 314 p. $149.95*

Specialists in imaging technology, Myhra (materials, U. of Oxford) and Rivière, retired from a British technology company, describe techniques and methods for characterizing nanostructures, and applications of the
techniques to structures of different dimensions and functions. The information would be known to specialists, they say, but they write for generalists who work with or interact with the specialists. Among their topics are electron-optical analytic techniques, techniques and methods for the nanoscale analysis of single particles and ensembles of particles, quantum dots and related structures, carbon nanotubes and other tube structures, and graphene and other monolayer structures.

TA418 9780857092069
Defect structure in nanomaterials.
Gubicza, Jenő.
Woodhead Publishing, ©2012 358 p. $245.00
The relationship between the production methods, the lattice defects, and the physical properties in nanomaterials is very important, says Gubicza (physics, Eötvös Loránd U., Hungary), both for understanding the fundamental science involved and for the practical application of the materials. He synthesizes the knowledge of lattice defects formed in nanomaterials either in their production or during subsequent straining and storage. Among his topics are processing methods for nanomaterials, defect structure in low stacking fault energy nanomaterials, correlation between defect structure and mechanical properties of nanocrystalline materials, the thermal stability of defect structures, and relationships between microstructure and hydrogen storage properties in nanomaterials.

TA455 9781926895154
Polymer processing and characterization.
Title main entry. Ed. by Sabu Thomas et al. (Advances in materials science; v.1)
Apple Academic Press, ©2013 154 p. $99.95
Chemists, physicists, and materials scientists and engineers report the results of their research into polymers and possible commercial application of their findings. Among their topics are chelating ion-exchange properties of copolymer resins, high performance shear stable viscosity modifiers, crack grown rates of rubber vulcanizates, the effect of nanoparticles on complexed polymer electrolytes, and synthesizing and characterizing zinc sulfide nanocrystals and zinc sulfide/polyvinyl alcohol nanocomposites for luminescence applications.

TA459 9781615038275
ASM handbook; materials for medical devices; v.23.
ASM International, ©2012 384 p. $279.00
This handbook describes the properties of metals, ceramics, polymers, and composite materials used for implants in medicine and dentistry. It also considers the degradation of biomaterials and cell-material interactions, noting that many biomaterials operate under very demanding and highly corrosive conditions. After introductory chapters, the sections cover corrosion and biocompatibility, biotribology and implant wear, medical implant materials, and implant evaluation. Among the topics are microjoining in medical components and devices, the biocompatibility of ceramics, friction and wear in medical implants and prosthetic devices, dental composite resins, and medical device failure analysis.

TA712 9780123971685
Underground infrastructures; planning, design, and construction.
Goel, R.K. et al.
Butterworth-Heinemann, ©2012 335 p. $99.95
Goel (Central Institute of Mining & Fuel Research, India), his long-time collaborator Bhawani Singh, and Jian Zhao (Ecole Polytechnique Federale de Lausanne, Switzerland) provide a broad guide to underground elements of cities for city planners, civil and mining engineers, architects, military engineers, administrators, and municipal authorities. Among their topics are the classification of underground space, the underground storage of water, underground metro and road tunnels, civil facilities underground, and contractual risk sharing.

TA1145 9781848213777
Advanced mobility and transport engineering.
Title main entry. Ed. by Slim Hammadi and Mekki Ksouri.
ISTE/Wiley, ©2012 246 p. $125.00
A network of French engineers that grew out of the International Campus on Safety and Intermodality in Transport have assembled a broad reference to transport engineering and high-technology mobility. It covers agent-oriented road traffic simulation, an agent-based information system for searching and creating mobility-aiding services, inter-vehicle services and communication, modeling and controlling traffic flow, and criteria and methods for interactive system evaluation with application to a regulation post in the transport domain.

TA1520 9783527410545
The photophysics behind photovoltaics and photonics.
Lanzani, Guglielmo.
Wiley-VCH, ©2012 212 p. $99.95
In an era of climate change and global warming, alternative, clean, and safe energy sources are critical--and so is understanding them and how they work to make them as effective as possible. Lanzani (Center for Nano Science and Technology, Italian Institute of Technology, and physics, Politecnico di Milano, Italy) offers a basic and practical understanding of material photophysics for planning, implementing, and interpreting spectroscopy experiments. Topics include molecular exciton, excited states in solids, photoexcitation dynamics, the photophysics toolbox, vibrational spectroscopy, charge transfer and transport, and pump probe and other modulation techniques. The book is technical, but clearly written and illustrated.
ENVIRONMENTAL TECHNOLOGY

TD172 9781439892381
Environmental contamination; health risks and ecological restoration.
Title main entry. Ed. by Ming H. Wong.
CRC Press, ©2013 499 p. $139.95
This reference includes research from 62 scientists focused on the remediation of contaminated land. In addition to a number of illustrative case studies, the book also covers health impacts of toxic chemicals and health risk assessment, current problems and trends, emerging chemicals and electronic waste, bioremediation, phyto-remediation, environmentally friendly and sustainable solutions, and other types of pollution control and management. The book will interest both professionals and students in related fields, policy makers, scientists and researchers, and others concerned about the issues involved in remediation. Editor is Wong (environmental and resource sciences, Zhejiang Agriculture and Forestry U., China).

TD193 9780470972014
Handbook of green analytical chemistry.
Title main entry. Ed. by Miguel de la Guardia and Salvador Garrigues.
John Wiley & Sons, ©2012 546 p. $180.00
Editors de la Guardia and Garrigues (both: U. of Valencia, Spain) emphasize in their introduction that clearly the time has come to put principles into practice and make environmentally friendly processes prevail at every step in every environment where chemical analysis is performed. They wrote the first two chapters-on concepts and on education. Following are contributions on the analytical process (e.g. sampling techniques, direct analysis of samples, sample preparation, capillary electrophoresis, chromatography, atomic spectrometry); strategies (energy savings, miniaturization, micro- and nanomaterials based detection systems applied in lab-on-a-chip technology); and fields of application (bioanalytical chemistry, infrared spectroscopy in biodiagnostics, environmental and industrial analysis). Contributions are from chemists based in Spain, Italy, Brazil, and a half dozen other countries.

TD353 9781926895222
Advances in control and automation of water systems.
Title main entry. Ed. by Kaveh Hariri Asli et al.
Apple Academic Press, ©2013 178 p. $119.95
Asli (National Academy of Science, of Azerbaijan), Hossein Hariri Asli (Applied Science U., Iran), Reza Khodaparast Haghi (U. of Salford, Britain), and Faig Bakhman Ogli Naghiyev (Baku State U., Azerbaijan) explain the main computational techniques used in the control and automation of water systems. They introduce the theoretical background of several techniques, examine general data analysis techniques and their application in commercial settings, and set

TA1632 9780769547749
Frontiers in handwriting recognition; proceedings.
International Conference on Frontiers in Handwriting Recognition (13th: 2012: Bari, Italy)
Computer Society Press, ©2012 840 p. $291.00 (pa)
In addition to 84 poster papers, 48 papers were selected for oral presentation. They examine topics in word spotting, digit recognition, a codebook for handwriting recognition, segmentation techniques for flowchart recognition, word segmentation, multilingual recognition, character classification, bank check processing and postal automation, mathematical expression, signature recognition, writer identification, forensic applications, and historical documents. Among the topics of poster papers are Persian signature verification based on fractal dimension using testing hypothesis, a novel naive Bayes voting strategy for combining classifiers, and a neural scheme for procedural motor learning of handwriting. There is no subject index.

TA1634 9780470890844
Color in computer vision; fundamentals and applications.
Gevers, Theo et al. (Wiley IS&T series in imaging science and technology)
John Wiley & Sons, ©2012 366 p. $110.00
Computer scientists at the Intelligent Systems Laboratory at the University of Amsterdam, and the Free University of Barcelona, present color theories, representation models, and computational methods that are essential for image understanding from a color perspective in computer vision. They cover color fundamentals, photometric invariance, color constancy, extracting color features, and applications. Among specific topics are color image formation, photometric invariance from color ratios, color constancy using low-level features, evaluating color constancy methods, color image segmentation, and object and scene recognition.

TA1750 9780470517505
Silicon photonics; fundamentals and devices.
Deen, M. Jamal and P.K. Basu. (Wiley series in materials for electronic and optoelectronic applications)
John Wiley & Sons, ©2012 433 p. $195.00
Deen (electrical and computer engineering, McMaster U., Canada) and Basu (radiophysics and electronics, U. of Calcutta, India) have been working for a decade on this textbook introducing the troubled place of silicon in photonics. It is targeted to senior and graduate students, practicing engineers and technologists, and beginners in photonics who need to know the basic principles and overall development. Among the topics are basic principles of silicon, quantum structures, light emitters in silicon, silicon photodetectors, guided lightwaves, and waveguides for dense wavelength-division multiplexing systems. Chapter-end problems are provided.
out current practices and research results. The information could be useful to academics, researchers, and engineers in hydraulic and mechanical engineering and related fields. The topics include the mathematical modeling of hydraulic transients in simple systems, improved numerical modeling for perturbations in homogeneous and stratified flows, and a computational approach to heat and mass transfer in binary mixtures. Distributed in the US by CRC Press, a member of the Taylor & Francis Group.

MECHANICAL ENGINEERING & MACHINERY

TJ163 9783037853801

Mechatronics and applied mechanics; proceedings; 2v.
International Conference on Mechatronics and Applied Mechanics (2012: Hong Kong) Ed. by Jing Guo. (Applied mechanics and materials; vs.157-158)

Trans Tech Publications, ©2012 1714 p. $414.00 (pa)

In the peer-reviewed papers from a December 2011 conference compiled in this two-volume set, researchers, engineers, academicians, and industry professionals reveal the latest research results and development activities in the field. Volume 1 contains sections on manufacturing technology and processing, mechatronics and automation, and mechatronics and embedded system applications. Some subjects explored include English-Chinese machine translation, localization issues in underwater sensor networks, and geometric and material nonlinear analysis of a bioprosthetic heart valve. Volume 2 contains sections on applied mechanics, materials machining, control system modeling, and intelligent mechatronics. Paper topics include long-term voltage stability enhancement by model predictive control, a service component model for semiconductor test equipment, a mathematical modeling and optimization approach for trajectory planning of robot manipulators, and research on the application of wireless communication technology in earthquake rescues. B&w photos and images are included.

BUILDING CONSTRUCTION

TH437 9780470658017

Mobile and pervasive computing in construction.

Mobile and pervasive computing is playing an increasingly important role in architecture and construction, but until now there has not been a book-length reference on the application. Architects, civil engineers, and computer scientists consider such aspects as the mobile and semantic web-based delivery of context-aware information and services in construction, a framework for designing mobile virtual training systems through virtual modeling technology, ubiquitous user localization for pervasive context-aware construction applications, a person-oriented mobile information system that enhances engineering communication in construction processes, computer vision and pattern recognition technologies for construction, and monitoring structural health using wireless sensor networks.

SciTech News
between the robotics and radar communities by showing how to apply radar to robotic vehicle navigation. They cover fundamentals of radar and robotic navigation, radar modeling and scan integration, robotic mapping with known vehicle location, and simultaneous localization and mapping. Among specific topics are detection theory, reducing detection errors and noise with multiple radar scans, grid-based robotic mapping with detection likelihood filtering, and feature-based robotic mapping with random finite sets.

**Solar energy at urban scale.**


This research work is intended to be considered a complete reference on solar energy and the urban environment—not solar energy as a source of sustainable renewable energy but solar energy in the sense of solar radiation. The book is arranged in four primary parts: measuring and modeling solar radiation, its effects on the urban climate, light and heat modeling, and urban planning in the sense of taking solar radiation into account in the processes of regulation and planning in different climate zones. Growing urbanization, the depletion of cheap energy (fossil fuels), and worries about global warming have elevated the city to the status of extremely important problem. The authors recommend a multidisciplinary approach to dealing with solar radiation in urban environments that includes elements of meteorology, geography, architecture, and urban engineering systems. The book will interest a variety of professionals ranging from urban planners to policy makers and those working in the sciences listed. Editor is Beckers (urban systems engineering, Compiègne U. of Technology, France).

**Electrical Engineering, Electronics, Nuclear Engineering**

**Fuel cell science and engineering; materials, processes, systems and technology; 2v.**


Stolten and Emonts (Institute of Energy Research-Fuel Cells, Research Center Jülich, Germany) compile 41 chapters by US and European engineers in academia, industry, institutions, and government who explore specific fuel cells within and beyond mainstream development and materials and production processes for solid oxide fuel cells (SOFCs) and low-temperature fuel cells, analytics and diagnostics, modeling and simulation, and balance of plant design and components. In the first volume, they discuss the technical advancement of fuel-cell research and development; single-chamber, molten carbonate, alkaline, micro, microbial, and regenerative fuel cells; micro-reactors for fuel processing; SOFC electrode fabrication by infiltration; sealing technology; phosphoric acid for fuel cells; materials and coatings for metallic bipolar plates in polymer electrolyte membrane fuel cells; and other topics. The second volume covers analytical, stochastic, and numerical modeling; computational fluid dynamic simulation using supercomputer calculation capacity; modeling SOFCs from the macroscale to the nanoscale; modeling of molten carbonate and high-temperature polymer electrolyte fuel cells and electrolyte membrane fuel-cell components, fuel cells, and stacks; systems engineering; system technology; desulfurization; design criteria and components; hybridization; off-grid power supply and premium power generation; demonstration projects and market introduction; and knowledge distribution and public awareness.

**Polymer electrolyte fuel cell degradation.**


Now that fuel cells are in commercial production—in the rest of the world if not in the US—one of the questions that remain is the long-term durability of fuel cell systems. Here researchers review the current understanding of the durability of polymer electrolyte fuel cells. Among their topics are the status and targets of durability, electrochemical degradation; electrocatalyst and support durability, gas diffusion media and their degradation, freeze damage, advanced high-resolution characterization techniques for degradation studies, and computational modeling aspects. Academic Press is an imprint of Elsevier.

**Next-generation batteries and fuel cells for commercial, military, and space applications.**

Jha, A.R. *CRC Press, ©2012* 386 p. $79.95

Jha, an engineer with a very broad background and author of 10 high technology books, provides a technical but readable examination...
of new technologies and systems for extremely reliable rechargeable batteries for commercial, military, and space applications. The book is certainly timely in that electric vehicle manufacturers are on a constant quest for more powerful and reliable batteries, not to mention the military’s increasing focus on a variety of alternative and emerging technologies to meet its changing needs, growing interest from the medical community, and the anticipation of a shortage of oil in the future. The author addresses the current status of rechargeable batteries and fuel cells, the key technologies and their characteristics, as well as issues related to longevity, safety, and cost.

TK5102 9780123809186
Network coding; fundamentals and applications. (online access included)
Title main entry. Ed. by Muriel Médard and Alex Sprintson. Academic Press, ©2012 315 p. $89.95
Computer scientists, electrical engineers, and related professionals provide a tutorial introduction and survey of practical applications of network coding in various areas of networking and distributed computing. They write for researchers, practitioners, and graduate students who have a general background in networking but no prior exposure to network coding techniques or applications of network coding. The topics include harnessing network coding in wireless systems, network coding in the real world, network coding and user cooperation for streaming and download services in long term evolution networks, bounds and algorithms for secret and reliable communications, and network coding in disruption tolerant networks. Academic Press is an imprint of Elsevier.

TK5103 9780769548340
Fault diagnosis and tolerance in cryptography; proceedings.
Researchers and engineers examine the effect of faults, either accidental or malicious, on integrated circuits that are implementing cryptographic algorithms. The invited papers discuss equipment, techniques, and experimental results for electromagnetic fault injection; and fault attacks on symmetric cryptography. Another 10 papers cover fault injection and simulation, differential fault analysis, fault analysis, and countermeasures. Among the topics are circuit simulation for fault sensitivity analysis and its application to cryptographic LSI, differential fault analysis on lightweight blockciphers with statistical cryptanalysis techniques, combined fault and side-channel attacks on the AES key schedule, the need for randomness in fault attack countermeasures, and random active shield.

TK5103 9781466619814
Mobile services industries, technologies, and applications in the global economy.
Title main entry. Ed. by In Lee. Information Science Reference, ©2013 348 p. $190.00
The 18 papers in this collection examine competition and dynamics within the mobile service industries, technologies and standards for new mobile services, and the state-of-the-art in mobile applications. The contributors discuss whether the diffusion of mobile service is an evolutionary process, the relationship between fixed wire and mobile broadband, the smartphone market in China, runtime discovery of web services in mobile environments, and HTML 5. The application chapters describe recommendation systems for online articles, location-based social networks, near-field communication adoption factors, and RFID systems for delivering healthcare.

TK5103 9781578088034
Embedded systems and wireless technology; theory and practical applications.
Computer scientists and related professionals in Mexico, Morocco, Romania, elsewhere in Europe, and Canada survey embedded systems within larger wireless systems, mostly for remote sensing and control. The topics include a software engineering view of orchestrating mobile applications, indoor and outdoor event detection for embedded wireless sensors, image processing applied in agriculture, application management in low power distributed embedded systems, and an embedded system using GNU/Linux for automating low Earth orbit satellite tracking.

TK5103 9783898386661
A method for reusing and re-engineering non-ontological resources for building ontologies.
Villazón-Terrazas, Boris. (Studies on the semantic web; v.12) IOS Press, ©2012 275 p. $73.00 (pa)
Villazón-Terrazas (information, Polytechnic U., of Madrid, Spain) introduces a novel method for building ontology networks by reusing knowledge and drawing resources from ontology. The scenario he describes emphasizes re-engineering knowledge resources for building ontologies that are connected with other ontologies in the ontology network. Among his topics are the state of the art, research methodology, a pattern-based re-engineering method, patterns for re-engineering thesauri, technological support, and evaluation.
Coupled-oscillator based active-array antennas.

Pogorzelski, Ronald J. and Apostolos Georgiadis. (JPL deep-space communications and navigation series; 11)  
*John Wiley & Sons,* ©2012 357 p. $140.00

Laser growth and processing of photonic devices.

Title main entry. Ed. by Nikolaos A. Vainos. (Woodhead Publishing series in electronic and optical materials; no.27)  
*Woodhead Publishing,* ©2012 467 p. $265.00

Networked multisensor decision and estimation fusion; based on advanced mathematical methods.

Zhu, Yunmin et al.  
*CRC Press,* ©2013 417 p. $99.95

Antennas for global navigation satellite systems.

Title main entry. Ed. by Xiaodong Chen et al.  
*Woodhead Publishing,* ©2012 357 p. $140.00

Ultrasonic transducers; materials and design for sensors, actuators and medical applications.

Title main entry. Ed. by K. Nakamura. (Woodhead Publishing series in electronic and optical materials; no.29)  
*Woodhead Publishing,* ©2012 722 p. $305.00

Fingerman: Sci-Tech Book News Reviews

SciTech News

Published by Jefferson Digital Commons, 2012
soft biometrics for person recognition, iris biometrics, voice biometrics for verifying and identifying a speaker, evaluating the performance of biometric systems, data cryptography, visual data protection, and biometrics in forensics.

TK8322 9781466619272
Advanced solar cell materials, technology, modeling, and simulation.
Title main entry. Ed. by Laurentiu Fara and Masafumi Yamaguchi.
Information Science Reference, ©2013 336 p. $195.00
This work considers a new paradigm in photovoltaic conversion, using quantum confinement as well as light and thermal management. Chapters by international photovoltaic scientists shed light on the latest materials, technology, modeling, simulation, and device and system designs for different types of advanced solar cells. The first part of the book reviews new trends in solar cells and discusses the physical limitations of photovoltaic conversion. Later sections deal with quantum well solar cells, hybrid and polymer solar cells, high efficiency solar cells, and luminescent solar concentrators. Some specific topics explored include phononic engineering for hot carrier solar cells, quantum dot solar cells, and quantum confinement modeling and simulation for quantum well solar cells. The book's readership includes researchers, engineers, and advanced students in engineering, physics, chemistry, materials science, and optical and electrical engineering. Fara is affiliated with Polytechnic University of Bucharest, Romania. Yamaguchi is affiliated with Toyota Technological Institute, Japan.

MOTOR VEHICLES, AERONAUTICS, ASTRONAUTICS

TL900 9781845699963
Spacecraft thermal control.
Meseguer, José et al.
Woodhead Publishing, ©2012 382 p. $265.00
Meseguer, A. Sanz-Adrés (both aerospace engineering), and I. Pérez-Grande (thermodynamics, all U. Politénica de Madrid, Spain) have sifted through the voluminous literature and assembled the basic knowledge needed to understand how the thermal control subsystem of a spacecraft works. Their goal is to provide a basic guide for aerospace engineering graduate students, for engineers new to the field, for engineers in neighboring fields, and for specialists in other spacecraft subsystems. Among the topics are space environment, thermal radiation heat transfer, phase change capacitors, thermoelectric cooling, and thermal mathematical models.

UG485 9781608072071
Introduction to modern EW systems.
De Martino, Andrea.
Artech House, ©2012 417 p. $159.00
The chief technical officer at an Italian electronics company, De Martino explains technical dimensions of electronic warfare (EW) systems. He covers scenarios, the evolution of signal emitters and sensors, radio frequency band sensor systems, radio frequency direction-finding and emitter location techniques, electronic countermeasure systems, and electronic countermeasure techniques and sensors.

CHEMICAL TECHNOLOGY

TP155 9780080971742
Chemical and process plant commissioning handbook; a practical guide to plant system and equipment installation and commissioning.
Killcross, Martin.
This handbook for new and experienced commissioning engineers, project managers, and operations managers offers a methodology for commissioning chemical and process plants, which can be used when commissioning a new plant, or for modified equipment in an existing facility, or in a turnaround or overhaul scenario. The handbook takes the approach that commissioning is a series of checks and counter-checks to confirm that the newly constructed chemical plant is fit for purpose and suitable for ongoing operation. The book is divided into sections on preparation, implementation, and close-out, with much information in bullet list format. For each step of the process, the handbook offers worked examples, checklists, and guidance on paperwork. The book also includes about 70 pages of sample blank documents, which can be used to creation commissioning manuals, plus 40 pages of schematics and engineering drawings especially designed to illustrate info in the handbook. Killcross is a commissioning consultant.

TP156 9780470711187
Hot-melt extrusion; pharmaceutical applications.
Title main entry. Ed. by Dennis Dourounis.
John Wiley & Sons, ©2012 364 p. $180.00
Hot-melt extrusion is an emerging continuous processing technology for developing various solid dosage forms and drug delivery systems that has attract increasing attention in both academic and commercial settings for the past 20 years. Here chemists review the theory, instrumentation, and wide spectrum of applications. Among their topics are principles of single-screw extrusion, solubility parameters for predicting drug/polymer miscibility in hot-melt extruded formulations, taste masking using hot-melt extrusion, laminar dispersive and distributive mixing with dissolution and applications to hot-melt extrusion, and devices and implant systems by hot-melt extrusion.
Erkey (Ko<,c> U., Istanbul) explores applications of supercritical fluid that involve using metal complexes consisting of organometallic compounds and chemical complexes. Writing for scientists and engineers who are working with supercritical liquids, or who would like to, he discusses coordination compounds, fundamental aspects of supercritical fluids, the thermodynamics of mixtures of metal complexes with supercritical fluids, the thermodynamics and dynamics of adsorption of metal complexes on surfaces from supercritical solutions, the synthesis of nanostructured composites of metals, extracting metals using supercritical fluids, homogeneous catalysis in supercritical fluids, preparing powders by arrested precipitation processes using reactions of metal complexes in supercritical fluids, and future research needs.

**PUBLISHING, LIBRARY SCIENCE, BIBLIOGRAPHY**

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Planning and implementing resource discovery tools in academic libraries.
Title main entry. Ed. by Mary Pagliero Popp and Diane Dallis.
Information Science Reference, ©2012 732 p. $175.00
For librarians and administrators, Popp, a resource and discovery librarian at Indiana U. Bloomington, and Dallis, a dean for academic library services there, bring together 40 chapters by librarians from US and Canadian universities on planning and implementing resource discovery tools to meet the needs of users for a simple search and the desires of librarians to present scholarly research in ways appropriate for today’s user, who is used to simple web search engines. They first review information seeking among academic users, the federated search as a precursor to discovery tools, and issues involved in planning, implementation, use, and maintenance of discovery tools. Then, through case studies of various universities, they describe how to evaluate tools; user behavior and expectations; user teaching and user-centered design in implementing discovery solutions, with discussion of EBSCO Discovery Services, Primo from ExLibris, and Serials Solutions Summon; implementation issues, including resource selection and configuration of the public interface and the development of an in-house discovery tool; embedding the tool within environments such as a learning management system and enterprise portal or a consortium environment; supporting organizational buy-in; marketing; the impact on collection use and cataloging maintenance; experiences in selecting and implementing products like Encore Strategy, Primo Central, and WorldCat Local; and problems of next generation search tools and the challenges and opportunities of the metadata environment in the context of discovery tools, as well as tools for music researchers. ✴