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Occupational Health and Safety in the Care and Use of Research Animals CRC Press
In the era of propelling traditional energy systems to evolve towards smart energy systems, including power generation, energy storage systems, and electricity consumption have become more dynamic. The quality and reliability of power supply are impacted by the sporadic and rising use of electric vehicles, and domestic & industrial loads. Similarly, with the integration of solid state devices, renewable sources, and distributed generation, power generation processes are evolving in a variety of ways. Several cutting-edge technologies are necessary for the safe and secure operation of power systems in such a dynamic setting, including load distribution automation, energy regulation and control, and energy trading. This book covers the applications of various big data analytics, artificial intelligence, and machine learning technologies in smart grids for demand prediction, decision-making processes, policy, and energy management. The book delves into the new technologies such as the Internet of Things, blockchain, etc. for smart home solutions, and smart city solutions in depth in the context of the modern power systems. Technical topics discussed in the book include: • Hybrid smart energy system technologies • Energy demand forecasting • Use of different protocols and communication in smart energy systems • Power quality and allied issues and mitigation using AI • Intelligent transportation • Virtual power plants • AI business models.

Washington State Register CRC Press
Covering the theoretical aspects of image processing and analysis through the use of graphs in the representation and analysis of objects, Image Processing and Analysis with Graphs: Theory and Practice also demonstrates how these concepts are indispensible for the design of cutting-edge solutions for real-world applications. Explores new applications in computational photography, image and video processing, computer graphics, recognition, medical and biomedical imaging With the explosive growth in image production, in everything from digital photographs to medical scans, there has been a drastic increase in the number of applications based on digital images. This book explores how graphs—which are suitable to represent any discrete data by modeling neighborhood relationships—have emerged as the perfect unified tool to represent, process, and analyze images. It also explains why graphs are ideal for defining graph-theoretical algorithms that enable the processing of functions, making it possible to draw on the rich literature of combinatorial optimization to produce highly efficient solutions. Some key subjects covered in the book include: Definition of graph-theoretical algorithms that enable denoising and image enhancement Energy minimization and modeling of pixel-labeling problems with graph cuts and Markov Random Fields Image processing with graphs: targeted segmentation, partial differential equations, mathematical morphology, and wavelets Analysis of the similarity between objects with graph matching Adaptation and use of graph-theoretical algorithms for specific imaging applications in computational photography, computer vision, and medical and biomedical imaging Use of graphs has become very influential in computer science and has led to many applications in denoising, enhancement, restoration, and object extraction. Accounting for the wide variety of problems being solved with graphs in image processing and computer vision, this book is a contributed volume of chapters written by renowned experts who address specific techniques or applications. This state-of-the-art overview provides application examples that illustrate practical application of theoretical algorithms. Useful as a support for graduate courses in image processing and computer vision, it is also perfect as a reference for practicing engineers working on development and implementation of image processing and analysis algorithms.

Applications of Big Data and Artificial Intelligence in Smart Energy Systems CRC Press
This edited collection of articles addresses aspects of medical care in which human error is associated with unanticipated adverse outcomes. For the purposes of this book, human error encompasses mismanagement of medical care due to: * inadequacies or ambiguity in the design of a medical device or institutional setting for the delivery of medical care; * inappropriate responses to antagonistic environmental conditions such as crowding and excessive clutter in institutional settings, extremes in weather, or lack of power and water in a home or field setting; * cognitive errors of omission and commission precipitated by inadequate information and/or situational factors -- stress, fatigue, excessive cognitive workload. The first to address the subject of human error in medicine, this book considers the topic from a problem oriented, systems perspective; that is, human error is considered not as the source of the problem, but as a flag indicating that a problem exists. The focus is on the identification of the factors within the system in which an error occurs that contribute to the problem of human error. As those factors are identified, efforts to alleviate them can be instituted and reduce the likelihood of error in medical care. Human error occurs in all aspects of human activity and can have particularly grave consequences when it occurs in medicine. Nearly everyone at some point in life will be the recipient of medical care and has the possibility of experiencing the consequences of medical error. The consideration of human error in medicine is important because of the number of people that are affected, the problems incurred by such error, and the societal impact of such problems. The cost of those consequences to the individuals involved in medical error, both in the health care providers' concern and the patients' emotional and physical pain, the cost of care to alleviate the consequences of the error, and the cost to society in dollars and in lost personal contributions, mandates consideration of ways to reduce the likelihood of human error in medicine. The chapters were written by leaders in a variety of fields, including psychology,

medicine, engineering, cognitive science, human factors, gerontology, and nursing. Their experience was gained through actual hands-on provision of medical care and/or research into factors contributing to error in such care. Because of the experience of the chapter authors, their systematic consideration of the issues in this book affords the reader an insightful, applied approach to human error in medicine -- an approach fortified by academic discipline.

New Techniques in Interventional Musculoskeletal Radiology CRC Press
Of the "big three" components of electrical infrastructure, distribution typically gets the least attention. In fact, a thorough, up-to-date treatment of the subject hasn't been published in years, yet deregulation and technical changes have increased the need for better information. Filling this void, the Electric Power Distribution Handbook delivers comprehensive, cutting-edge coverage of the electrical aspects of power distribution systems. The first few chapters of this pragmatic guidebook focus on equipment-oriented information and applications such as choosing transformer connections, sizing and placing capacitors, and setting regulators. The middle portion discusses reliability and power quality, while the end tackles lightning protection, grounding, and safety. The Second Edition of this CHOICE Award winner features: 1 new chapter on overhead line performance and 14 fully revised chapters incorporating updates from several EPRI projects New sections on voltage optimization, arc flash, and contact voltage Full-color illustrations throughout, plus fresh bibliographic references, tables, graphs, methods, and statistics Updates on conductor burndown, fault location, reliability programs, tree contacts, automation, and grounding and personnel protection Access to an author-maintained support website, distributionhandbook.com, with problems sets, resources, and online apps An unparalleled source of tips and solutions for improving performance, the Electric Power Distribution Handbook, Second Edition provides power and utility engineers with the technical information and practical tools they need to understand the applied science of distribution.

Lie Algebras In Particle Physics National Academies Press
InfoWorld is targeted to Senior IT professionals. Content is segmented into Channels and Topic Centers. InfoWorld also celebrates people, companies, and projects.

OSPF and IS-IS CRC Press
This second edition of a bestseller is a practical guide to the production of castable polyurethane articles. The book shows the progression from raw materials to prepolymer production, including the chemistry and functionality of the processes. It provides a comprehensive look at various problem-solving and processing techniques, examining the selection of different systems on both the micro and macro levels. Reorganized for better flow, this edition describes new processing methods, expands coverage of health and safety aspects, and brings all standards up to date.

Emergent Converging Technologies and Biomedical Systems CRC Press
Threat actors, be they cyber criminals, terrorists, hacktivists or disgruntled employees, are employing sophisticated attack techniques and anti-forensics tools to cover their attacks and breach attempts. As emerging and hybrid technologies continue to influence daily business decisions, the proactive use of cyber forensics to better assess the risks that the exploitation of these technologies pose to enterprise-wide operations is rapidly becoming a strategic business objective. This book moves beyond the typical, technical approach to discussing cyber forensics processes and procedures. Instead, the authors examine how cyber forensics can be applied to identifying, collecting, and examining evidential data from emerging and hybrid technologies, while taking steps to proactively manage the influence and impact, as well as the policy and governance aspects of these technologies and their effect on business operations. A world-class team of cyber forensics researchers, investigators, practitioners and law enforcement professionals have come together to provide the reader with insights and recommendations into the proactive application of cyber forensic methodologies and procedures to both protect data and to identify digital evidence related to the misuse of these data. This book is an essential guide for both the technical and non-technical executive, manager, attorney, auditor, and general practitioner who is seeking an authoritative source on how cyber forensics may be applied to both evidential data collection and to proactively managing today's and tomorrow's emerging and hybrid technologies. The book will also serve as a primary or supplemental text in both under- and post-graduate academic programs addressing information, operational and emerging technologies, cyber forensics, networks, cloud computing and cybersecurity.

Power System Dynamics and Stability CRC Press
This book offers solutions to all 284 exercises in Advanced R, Second Edition. All the solutions have been carefully documented and made to be as clear and accessible as possible. Working through the exercises and their solutions will give you a deeper understanding of a variety of programming challenges, many of which are relevant to everyday work. This will expand your set of tools on a technical and conceptual level. You will be able to transfer many of the specific programming schemes directly and will discover far more elegant solutions to everyday problems. Features: When R creates copies, and how it affects memory usage and code performance Everything you could ever want to know about functions The differences between calling and exiting handlers How to employ functional programming to solve modular tasks The motivation, mechanics, usage, and limitations of R's highly pragmatic S3 OO system The R6 OO system, which is more like OO programming in other languages The rules that R uses to parse and evaluate expressions How to use metaprogramming to generate HTML or LaTeX with elegant R code How to identify and resolve performance bottlenecks

ORYZA2000 CRC Press
For a one-semester senior or beginning graduate level course in power system dynamics. This text begins with the fundamental laws for basic devices and systems in a mathematical modeling context. It includes systematic derivations of standard synchronous machine models with their fundamental controls. These individual models are interconnected for system analysis and simulation. Singular perturbation is used to

derive and explain reduced-order models.

Artificial Intelligence Techniques in Power Systems Operations and Analysis CRC Press
Accurate modeling of the interaction between convective and diffusive processes is one of the most common challenges in the numerical approximation of partial differential equations. This is partly due to the fact that numerical algorithms, and the techniques used for their analysis, tend to be very different in the two limiting cases of elliptic and hyperbolic equations. Many different ideas and approaches have been proposed in widely differing contexts to resolve the difficulties of exponential fitting, compact differencing, number upwinding, artificial viscosity, streamline diffusion, Petrov-Galerkin and evolution Galerkin being some examples from the main fields of finite difference and finite element methods. The main aim of this volume is to draw together all these ideas and see how they overlap and differ. The reader is provided with a useful and wide ranging source of algorithmic concepts and techniques of analysis. The material presented has been drawn both from theoretically oriented literature on finite differences, finite volume and finite element methods and also from accounts of practical, large-scale computing, particularly in the field of computational fluid dynamics.

Castable Polyurethane Elastomers Chapman and Hall/CRC
Wastewater Treatment by Reverse Osmosis Process provides a one-stop-shop for reverse osmosis (RO), outlining its scope and limitations for the removal of organic compounds from wastewater. This book covers the state-of-the-art on RO processes and describes ten RO process models of different features and complexities. It also covers the advanced model-based techniques for RO process operations, including various rigorous methods for process modelling, simulation, and optimization at the lowest energy cost, as well as advanced tools such as genetic algorithms for achieving the same. • Highlights different types of physico–chemical and biological wastewater treatment methods including hybrid systems • Provides an overview of membrane processes, focuses on different types of membrane processes for water treatment and explains characteristics of membrane modules • Introduces the importance and challenges of process modelling for simulation, design, and optimization and offers examples across various industries •Describes the concept of different types of genetic algorithms for process optimisation and provides the state-of-the art of the GA method in terms of its application in water desalination and wastewater treatment •Emphasizes economic aspects of RO processes for wastewater treatment With its focus on the challenges posed by an increasing demand for fresh water and the urgent need to recycle wastewater at minimum cost, this work is an invaluable resource for engineers and scientists working within the field of wastewater treatment.

Limit Analysis and Concrete Plasticity CRC Press
Unlike conventional power plants, wind plants emit no air pollutants or greenhouse gases—and wind energy is a free, renewable resource. However, the induction machines commonly used as wind generators have stability problems similar to the transient stability of synchronous machines. To minimize power, frequency, and voltage fluctuations caused by network faults or random wind speed variations, control mechanisms are necessary. Wind Energy Systems: Solutions for Power Quality and Stabilization clearly explains how to solve stability and power quality issues of wind generator systems. Covering fundamental concepts of wind energy conversion systems, the book discusses several means to enhance the transient stability of wind generator systems. It also explains the methodologies for minimizing fluctuations of power, frequency, and voltage. Topics covered include: An overview of wind energy and wind energy conversion systems Fundamentals of electric machines and power electronics Types of wind generator systems Challenges in integrating wind power into electricity grids Solutions for power quality problems Methods for improving transient stability during network faults Methods for minimizing power fluctuations of variable-speed wind generator systems This accessible book helps researchers and engineers understand the relative effectiveness of each method and select a suitable tool for wind generator stabilization. It also offers students an introduction to wind energy conversion systems, providing insights into important grid integration and stability issues.

InfoWorld IRRI
Most problems encountered in chemical engineering are sophisticated and interdisciplinary. Thus, it is important for today's engineering students, researchers, and professionals to be proficient in the use of software tools for problem solving. MATLAB® is one such tool that is distinguished by the ability to perform calculations in vector-matrix form, a large library of built-in functions, strong structural language, and a rich set of graphical visualization tools. Furthermore, MATLAB integrates computations, visualization and programming in an intuitive, user-friendly environment. Chemical Engineering Computation with MATLAB® presents basic to advanced levels of problem-solving techniques using MATLAB as the computation environment. The book provides examples and problems extracted from core chemical engineering subject areas and presents a basic instruction in the use of MATLAB for problem solving. It provides many examples and exercises and extensive problem-solving instruction and solutions for various problems. Solutions are developed using fundamental principles to construct mathematical models and an equation-oriented approach is used to generate numerical results. A wealth of examples demonstrate the implementation of various problem-solving approaches and methodologies for problem formulation, problem solving, analysis, and presentation, as well as visualization and documentation of results. This book also provides aid with advanced problems that are often encountered in graduate research and industrial operations, such as nonlinear regression, parameter estimation in differential systems, two-point boundary value problems and partial differential equations and optimization.

Managing the NIH Bethesda Campus Capital Assets for Success in a Highly Competitive Global Biomedical Research Environment CRC Press
The National Institutes of Health (NIH) is the primary agency of the United States government responsible for biomedical and public health research. Founded in the late 1870s, NIH has produced extraordinary advances in the treatment of common and rare diseases and leads the world in biomedical research. It is a critical national resource that plays an important role in supporting national security. The 310-acre Bethesda campus supports some 20,000 employees and contractors, and it contains more than 12 million square feet of facilities divided amongst nearly 100 buildings, including the largest dedicated research hospital in the world. The Bethesda campus supports some of the most sophisticated and groundbreaking biomedical research in the world. However, while some new state-of-the-art buildings have been constructed in recent years, essential maintenance for many facilities and the campus overall has been consistently deferred for many years. The deteriorating condition of NIH's built environment is now putting its ability to fulfill its mission at substantial risk. Managing the NIH Bethesda Campus's Capital Assets for Success in a Highly Competitive Global Biomedical Research Environment identifies the facilities in greatest need of repair on the Bethesda campus and evaluates cost estimates to determine what investment is needed for the NIH to successfully accomplish its mission going forward.

Tech Terms CRC Press
An exciting new edition of a classic text

Introduction to Probability and Statistics for Engineers and Scientists CRC Press
First published in 1984, Limit Analysis and Concrete Plasticity explains for advanced design engineers the principles of plasticity theory and its application to the design of reinforced and prestressed concrete structures, providing a thorough understanding of the subject, rather than simply applying current design formulas. Updated and revised th

Biosurveillance CRC Press
As the electrical industry continues to develop, one sector that still faces a range of concerns is the electrical distribution system. Excessive industrialization and inadequate billing are just a few issues that have plagued this electrical sector as it advances into the smart grid environment. Research is necessary to explore the possible solutions in fixing these problems and developing the distribution sector into an active and smart system. The Handbook of Research on New Solutions and

Technologies in Electrical Distribution Networks is a collection of innovative research on the methods and applications of solving major issues within the electrical distribution system. Some issues covered within the publication include distribution losses, improper monitoring of system, renewable energy integration with micro-grid and distributed energy sources, and smart home energy management system modelling. This book is ideally designed for power engineers, electrical engineers, energy professionals, developers, technologists, policymakers, researchers, academicians, industry professionals, and students seeking current research on improving this key sector of the electrical industry.

Human Error in Medicine CRC Press
Elements of probability; Random variables and expectation; Special; random variables; Sampling; Parameter estimation; Hypothesis testing; Regression; Analysis of variance; Goodness of fit and nonparametric testing; Life testing; Quality control; Simulation.

Chemical Engineering Computation with MATLAB® National Academies Press
As evidenced by the anthrax attacks in 2001, the SARS outbreak in 2003, and the H1N1 influenza pandemic in 2009, a pathogen does not recognize geographic or national boundaries, often leading to devastating consequences. Automated biosurveillance systems have emerged as key solutions for mitigating current and future health-related events. Focusing

Geotechnical Engineering CRC Press
This reference documents state-of-the-art trends and advancements in the utilization imaging modalities for the analysis of bones and their surrounding soft tissues, including muscles, tendons, ligaments, nerves, and blood vessels. Exploring technologies such as ultrasound, MRI, CT, CT arthrography, MR arthrography, and fluoroscopy, this source con