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KEY=BOOK - SHAMAR GAIGE

INTELLIGENT ENGINEERING SYSTEMS AND COMPUTATIONAL CYBERNETICS

Springer Science & Business Media Engineering practice often has to deal with complex systems of multiple variable and multiple parameter models almost always with strong non-linear coupling. The conventional analytical techniques-based approaches for describing and predicting the behaviour of such systems in many cases are doomed to failure from the outset, even in the phase of the construction of a more or less appropriate mathematical model. These approaches normally are too categorical in the sense that in the name of "modelling accuracy" they try to describe all the structural details of the real physical system to be modelled. This can significantly increase the intricacy of the model and may result in a enormous computational burden without achieving considerable improvement of the solution. The best paradigm exemplifying this situation may be the classic perturbation theory: the less significant the achievable correction, the more work has to be invested to obtain it. A further important component of machine intelligence is a kind of "structural uniformity" giving room and possibility to model arbitrary particular details a priori not specified and unknown. This idea is similar to the ready-to-wear industry, which introduced products, which can be slightly modified later on in contrast to tailor-

made creations aiming at maximum accuracy from the beginning. These subsequent corrections can be carried out by machines automatically. This “learning ability” is a key element of machine intelligence. The past decade confirmed that the view of typical components of the present soft computing as fuzzy logic, neural computing, evolutionary computation and probabilistic reasoning are of complementary nature and that the best results can be applied by their combined application. Today, the two complementary branches of Machine Intelligence, that is, Artificial Intelligence and Computational Intelligence serve as the basis of Intelligent Engineering Systems. The huge number of scientific results published in Journal and conference proceedings worldwide substantiates this statement. The present book contains several articles taking different viewpoints in the field of intelligent systems.

CHEMICAL ENGINEERING DESIGN

PRINCIPLES, PRACTICE AND ECONOMICS OF PLANT AND PROCESS DESIGN

Elsevier Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. New discussion of conceptual plant design, flowsheet development and revamp design Significantly increased coverage of capital cost estimation, process costing and economics New chapters on equipment selection, reactor design and solids handling processes New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography Increased coverage of batch processing, food, pharmaceutical and biological processes All equipment chapters in Part II revised and updated with current information Updated throughout for latest US codes and standards, including API, ASME and ISA design codes

and ANSI standards Additional worked examples and homework problems The most complete and up to date coverage of equipment selection 108 realistic commercial design projects from diverse industries A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

EMERGING RESEARCH IN DATA ENGINEERING SYSTEMS AND COMPUTER COMMUNICATIONS

PROCEEDINGS OF CCODE 2019

Springer Nature This book gathers selected papers presented at the 2nd International Conference on Computing, Communications and Data Engineering, held at Sri Padmavati Mahila Visvavidyalayam, Tirupati, India from 1 to 2 Feb 2019. Chiefly discussing major issues and challenges in data engineering systems and computer communications, the topics covered include wireless systems and IoT, machine learning, optimization, control, statistics, and social computing.

ADOBE® ACROBAT® AND PDF FOR ARCHITECTURE, ENGINEERING, AND CONSTRUCTION

Springer Science & Business Media Applied Acrobat for Engineers is the first and only book to be written specifically to give engineers the skills that they need to use pdfs and Adobe Acrobat in engineering applications. Teaches the use of PDF in communication and archiving of complex documents with a specific slant towards various engineering disciplines and the related areas of architecture and construction management Better document control reduces project review and approval times Uses the progressive treatment of a sample project, throughout the book, to explain and illustrate the application of Acrobat techniques Encourages easier interaction with clients and regulatory agencies by employing a completely searchable document format which is available to all

CELL CULTURE ENGINEERING

RECOMBINANT PROTEIN PRODUCTION

John Wiley & Sons Offers a comprehensive overview of cell culture engineering, providing insight into cell engineering, systems biology approaches and processing technology In *Cell Culture Engineering: Recombinant Protein Production*, editors Gyun Min Lee and Helene Faustrup Kildegaard assemble top class authors to present expert coverage of topics such as: cell line development for therapeutic protein production; development of a transient gene expression upstream platform; and CHO synthetic biology. They

provide readers with everything they need to know about enhancing product and bioprocess attributes using genome-scale models of CHO metabolism; omics data and mammalian systems biotechnology; perfusion culture; and much more. This all-new, up-to-date reference covers all of the important aspects of cell culture engineering, including cell engineering, system biology approaches, and processing technology. It describes the challenges in cell line development and cell engineering, e.g. via gene editing tools like CRISPR/Cas9 and with the aim to engineer glycosylation patterns. Furthermore, it gives an overview about synthetic biology approaches applied to cell culture engineering and elaborates the use of CHO cells as common cell line for protein production. In addition, the book discusses the most important aspects of production processes, including cell culture media, batch, fed-batch, and perfusion processes as well as process analytical technology, quality by design, and scale down models. -Covers key elements of cell culture engineering applied to the production of recombinant proteins for therapeutic use -Focuses on mammalian and animal cells to help highlight synthetic and systems biology approaches to cell culture engineering, exemplified by the widely used CHO cell line -Part of the renowned "Advanced Biotechnology" book series Cell Culture Engineering: Recombinant Protein Production will appeal to biotechnologists, bioengineers, life scientists, chemical engineers, and PhD students in the life sciences.

DEEP LEARNING AND MISSING DATA IN ENGINEERING SYSTEMS

Springer Deep Learning and Missing Data in Engineering Systems uses deep learning and swarm intelligence methods to cover missing data estimation in engineering systems. The missing data estimation processes proposed in the book can be applied in image recognition and reconstruction. To facilitate the imputation of missing data, several artificial intelligence approaches are presented, including: deep autoencoder neural networks; deep denoising autoencoder networks; the bat algorithm; the cuckoo search algorithm; and the firefly algorithm. The hybrid models proposed are used to estimate the missing data in high-dimensional data settings more accurately. Swarm intelligence algorithms are applied to address critical questions such as model selection and model parameter estimation. The authors address feature extraction for the purpose of reconstructing the input data from reduced dimensions by the use of deep autoencoder neural networks. They illustrate new models diagrammatically, report their findings in tables, so as to put their methods on a sound statistical basis. The methods proposed speed up the process of data estimation while preserving known features of the data matrix. This book is a valuable source of information for researchers and practitioners in data science. Advanced undergraduate and postgraduate students studying topics in computational intelligence and big data, can also use the book as a reference for identifying and introducing new research thrusts in missing data estimation.

CLASSIC OPERATING SYSTEMS

FROM BATCH PROCESSING TO DISTRIBUTED SYSTEMS

Springer Science & Business Media An essential reader containing the 25 most important papers in the development of modern operating systems for computer science and software engineering. The papers illustrate the major breakthroughs in operating system technology from the 1950s to the 1990s. The editor provides an overview chapter and puts all development in perspective with chapter introductions and expository apparatus. Essential resource for graduates, professionals, and researchers in CS with an interest in operating system principles.

PRACTICAL BATCH PROCESS MANAGEMENT

Elsevier Historically batch control systems were designed individually to match a specific arrangement of plant equipment. They lacked the ability to convert to new products without having to modify the control systems, and did not lend themselves to integration with manufacturing management systems. Practical Batch Management Systems explains how to utilize the building blocks and arrange the structures of modern batch management systems to produce flexible schemes suitable for automated batch management, with the capability to be reconfigured to use the same plant equipment in different combinations. It introduces current best practice in the automation of batch processes, including the drive for integration with MES (Manufacturing Execution System) and ERP (Enterprise Resource Planning) products from major IT vendors. References and examples are drawn from DCS / PLC batch control products currently on the market. - Implement modern batch management systems that are flexible and easily reconfigured - Integrate batch management with other manufacturing systems including MES and ERP - Increase productivity through industry best practice

DEEP LEARNING AND MISSING DATA IN ENGINEERING SYSTEMS

Springer Deep Learning and Missing Data in Engineering Systems uses deep learning and swarm intelligence methods to cover missing data estimation in engineering systems. The missing data estimation processes proposed in the book can be applied in image recognition and reconstruction. To facilitate the imputation of missing data, several artificial intelligence approaches are presented, including: deep autoencoder neural networks; deep denoising autoencoder networks; the bat algorithm; the cuckoo search algorithm; and the firefly algorithm. The hybrid models proposed are used to estimate the missing data in high-dimensional data settings more accurately. Swarm intelligence algorithms are applied to address critical questions such as model selection and model parameter

estimation. The authors address feature extraction for the purpose of reconstructing the input data from reduced dimensions by the use of deep autoencoder neural networks. They illustrate new models diagrammatically, report their findings in tables, so as to put their methods on a sound statistical basis. The methods proposed speed up the process of data estimation while preserving known features of the data matrix. This book is a valuable source of information for researchers and practitioners in data science. Advanced undergraduate and postgraduate students studying topics in computational intelligence and big data, can also use the book as a reference for identifying and introducing new research thrusts in missing data estimation.

AZURE STORAGE, STREAMING, AND BATCH ANALYTICS

A GUIDE FOR DATA ENGINEERS

Manning Publications The Microsoft Azure cloud is an ideal platform for data-intensive applications. Designed for productivity, Azure provides pre-built services that make collection, storage, and analysis much easier to implement and manage. Azure Storage, Streaming, and Batch Analytics teaches you how to design a reliable, performant, and cost-effective data infrastructure in Azure by progressively building a complete working analytics system. Summary The Microsoft Azure cloud is an ideal platform for data-intensive applications. Designed for productivity, Azure provides pre-built services that make collection, storage, and analysis much easier to implement and manage. Azure Storage, Streaming, and Batch Analytics teaches you how to design a reliable, performant, and cost-effective data infrastructure in Azure by progressively building a complete working analytics system. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Microsoft Azure provides dozens of services that simplify storing and processing data. These services are secure, reliable, scalable, and cost efficient. About the book Azure Storage, Streaming, and Batch Analytics shows you how to build state-of-the-art data solutions with tools from the Microsoft Azure platform. Read along to construct a cloud-native data warehouse, adding features like real-time data processing. Based on the Lambda architecture for big data, the design uses scalable services such as Event Hubs, Stream Analytics, and SQL databases. Along the way, you'll cover most of the topics needed to earn an Azure data engineering certification. What's inside Configuring Azure services for speed and cost Constructing data pipelines with Data Factory Choosing the right data storage methods About the reader For readers familiar with database management. Examples in C# and PowerShell. About the author Richard Nuckolls is a senior developer building big data analytics and reporting systems in Azure. Table of Contents 1 What is data engineering? 2 Building an analytics system in Azure 3 General storage with Azure Storage accounts 4 Azure Data Lake Storage 5 Message handling with Event Hubs 6 Real-time queries with Azure Stream Analytics 7 Batch queries with Azure Data Lake Analytics 8 U-SQL for complex analytics 9 Integrating with Azure Data Lake Analytics 10 Service integration with Azure Data Factory 11 Managed SQL with Azure SQL

Database 12 Integrating Data Factory with SQL Database 13 Where to go next

BOOK DESIGN AND PRODUCTION

A GUIDE FOR AUTHORS AND PUBLISHERS

Aeonix Publishing Group In an industry burdened by complex technical issues, confusing practices, and a huge learning curve, *Book Design and Production* makes it easy. This is a one-stop resource to help authors and publishers find clear explanations of every facet of making a book a reality. Lucid descriptions cover editing, parts of a book, typefaces, design, layout, choosing a designer, selecting a printer, and more. This is the reference that every author/publisher needs.

PLANT-WIDE PROCESS CONTROL

John Wiley & Sons The complete control system engineering solution for continuous and batch manufacturing plants. This book presents a complete methodology of control system design for continuous and batch manufacturing in such diverse areas as pulp and paper, petrochemical, chemical, food, pharmaceutical, and biochemical production. Geared to practicing engineers faced with designing increasingly more sophisticated control systems in response to present-day economic and regulatory pressures, *Plantwide Process Control* focuses on the engineering portion of a plant automation improvement project. It features a full control design information package (Control Requirements Definition or CRD), and guides readers through all steps of the automation process—from the initial concept to design, simulation, testing, implementation, and operation. This unique and practical resource: * Integrates continuous, batch, and discrete control techniques. * Shows how to use the methodology with any automation project—existing or new, simple or complex, large or small. * Relates recent ISO and ISA standards to the discipline of control engineering. * Illustrates the methodology with a pulp-and-paper mill case study. * Incorporates numerous other examples, from single-loop controllers to multivariable controllers.

BATCH PROCESSING

MODELING AND DESIGN

CRC Press Although batch processing has existed for a long time, designing these processes and unit operations has been considered an onerous task that required computational efforts. Design of these processes is made more complex because of the time dependent nature of the process and the allowable flexibility. More often than not, every unit encounters optimal control problems. Therefore,

traditional design books have not covered batch processing in detail. Filling this void, *Batch Processing: Modeling and Design* describes various unit operations in batch and bio-processing as well as design methods for these units. Topics include: Batch distillation operating modes and configurations Batch absorption operations based on the solubility difference Batch adsorption based on differential affinity of various soluble molecules to solid absorbents Batch chromatography for measuring a wide variety of thermodynamic, kinetic, and physico-chemical properties Batch crystallization where a phase is used to find the supersaturation at which point material crystallizes Batch drying that stresses the phase diagram of water to describe this operation Batch filtration using a porous medium or screen to separate solids from liquids Batch centrifugation where centrifugal force is used for separation Batch processes are widely used in pharmaceutical, food, and specialty chemicals where high value, low volume products are manufactured. Recent developments in bio-based manufacturing also favor batch processes because feed variations can be easily handled in batch processes. Further, the emerging area of nanomaterials manufacturing currently uses batch processes as they are low volume, high energy intensive processes. With examples, case studies, and more than 100 homework problems, this book describes the unit operations in batch and bioprocessing and gives students a thorough grounding in the numerical methods necessary to solve these design problems.

DESIGNING DATA-INTENSIVE APPLICATIONS

THE BIG IDEAS BEHIND RELIABLE, SCALABLE, AND MAINTAINABLE SYSTEMS

"O'Reilly Media, Inc." Data is at the center of many challenges in system design today. Difficult issues need to be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by examining the pros and cons of various technologies for processing and storing data. Software keeps changing, but the fundamental principles remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems you already use, and learn how to use and operate them more effectively Make informed decisions by identifying the strengths and weaknesses of different tools Navigate the trade-offs around consistency, scalability, fault tolerance, and complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from their architectures

DESIGNING DISTRIBUTED SYSTEMS

PATTERNS AND PARADIGMS FOR SCALABLE, RELIABLE SERVICES

"O'Reilly Media, Inc." In the race to compete in today's fast-moving markets, large enterprises are busy adopting new technologies for creating new products, processes, and business models. But one obstacle on the road to digital transformation is placing too much emphasis on technology, and not enough on the types of processes technology enables. What if different lines of business could build their own services and applications—and decision-making was distributed rather than centralized? This report explores the concept of a digital business platform as a way of empowering individual business sectors to act on data in real time. Much innovation in a digital enterprise will increasingly happen at the edge, whether it involves business users (from marketers to data scientists) or IoT devices. To facilitate the process, your core IT team can provide these sectors with the digital tools they need to innovate quickly. This report explores: Key cultural and organizational changes for developing business capabilities through cross-functional product teams A platform for integrating applications, data sources, business partners, clients, mobile apps, social networks, and IoT devices Creating internal API programs for building innovative edge services in low-code or no-code environments Tools including Integration Platform as a Service, Application Platform as a Service, and Integration Software as a Service The challenge of integrating microservices and serverless architectures Event-driven architectures for processing and reacting to events in real time You'll also learn about a complete pervasive integration solution as a core component of a digital business platform to serve every audience in your organization.

21ST EUROPEAN SYMPOSIUM ON COMPUTER AIDED PROCESS ENGINEERING

Elsevier The European Symposium on Computer Aided Process Engineering (ESCAPE) series presents the latest innovations and achievements of leading professionals from the industrial and academic communities. The ESCAPE series serves as a forum for engineers, scientists, researchers, managers and students to present and discuss progress being made in the area of Computer Aided Process Engineering (CAPE). European industries large and small are bringing innovations into our lives, whether in the form of new technologies to address environmental problems, new products to make our homes more comfortable and energy efficient or new therapies to improve the health and well-being of European citizens. Moreover, the European Industry needs to undertake research and technological initiatives in response to humanity's "Grand Challenges", described in the declaration of Lund, namely, Global Warming, Tightening Supplies of Energy, Water and Food, Ageing Societies, Public Health, Pandemics and Security. Thus, the Technical Theme of ESCAPE 21 will be "Process Systems Approaches for Addressing Grand Challenges in Energy, Environment, Health,

Bioprocessing & Nanotechnologies".

INFORMATION THEORY, INFERENCE AND LEARNING ALGORITHMS

Cambridge University Press [Table of contents](#)

CONTINUOUS MANUFACTURING OF PHARMACEUTICALS

John Wiley & Sons A comprehensive look at existing technologies and processes for continuous manufacturing of pharmaceuticals As rising costs outpace new drug development, the pharmaceutical industry has come under intense pressure to improve the efficiency of its manufacturing processes. Continuous process manufacturing provides a proven solution. Among its many benefits are: minimized waste, energy consumption, and raw material use; the accelerated introduction of new drugs; the use of smaller production facilities with lower building and capital costs; the ability to monitor drug quality on a continuous basis; and enhanced process reliability and flexibility. Continuous Manufacturing of Pharmaceuticals prepares professionals to take advantage of that exciting new approach to improving drug manufacturing efficiency. This book covers key aspects of the continuous manufacturing of pharmaceuticals. The first part provides an overview of key chemical engineering principles and the current regulatory environment. The second covers existing technologies for manufacturing both small-molecule-based products and protein/peptide products. The following section is devoted to process analytical tools for continuously operating manufacturing environments. The final two sections treat the integration of several individual parts of processing into fully operating continuous process systems and summarize state-of-art approaches for innovative new manufacturing principles. Brings together the essential know-how for anyone working in drug manufacturing, as well as chemical, food, and pharmaceutical scientists working on continuous processing Covers chemical engineering principles, regulatory aspects, primary and secondary manufacturing, process analytical technology and quality-by-design Contains contributions from researchers in leading pharmaceutical companies, the FDA, and academic institutions Offers an extremely well-informed look at the most promising future approaches to continuous manufacturing of innovative pharmaceutical products Timely, comprehensive, and authoritative, Continuous Manufacturing of Pharmaceuticals is an important professional resource for researchers in industry and academe working in the fields of pharmaceuticals development and manufacturing.

ENGINEERING A SAFER WORLD

SYSTEMS THINKING APPLIED TO SAFETY

MIT Press A new approach to safety, based on systems thinking, that is more effective, less costly, and easier to use than current techniques. Engineering has experienced a technological revolution, but the basic engineering techniques applied in safety and reliability engineering, created in a simpler, analog world, have changed very little over the years. In this groundbreaking book, Nancy Leveson proposes a new approach to safety—more suited to today's complex, sociotechnical, software-intensive world—based on modern systems thinking and systems theory. Revisiting and updating ideas pioneered by 1950s aerospace engineers in their System Safety concept, and testing her new model extensively on real-world examples, Leveson has created a new approach to safety that is more effective, less expensive, and easier to use than current techniques. Arguing that traditional models of causality are inadequate, Leveson presents a new, extended model of causation (Systems-Theoretic Accident Model and Processes, or STAMP), then shows how the new model can be used to create techniques for system safety engineering, including accident analysis, hazard analysis, system design, safety in operations, and management of safety-critical systems. She applies the new techniques to real-world events including the friendly-fire loss of a U.S. Blackhawk helicopter in the first Gulf War; the Vioxx recall; the U.S. Navy SUBSAFE program; and the bacterial contamination of a public water supply in a Canadian town. Leveson's approach is relevant even beyond safety engineering, offering techniques for “reengineering” any large sociotechnical system to improve safety and manage risk.

ADOBE ACROBAT 8 PDF BIBLE

John Wiley & Sons "The Adobe Acrobat 8 PDF Bible is the comprehensive guide to Acrobat for novices and power users alike. With a concise, easy-to-read format, you will be creating interactive XML forms, enabling streamlined document review processes, and publishing high-impact electronic documents in no time." —Rick Brown, director of product management, Adobe Acrobat The book you need to succeed with Adobe Acrobat! Why do readers turn to the Adobe Acrobat Bible again and again? Because whether you're already experienced with Adobe Acrobat or you're learning to use this powerful tool for the first time, you'll find exactly what you need to know in these well-organized pages. Packed with helpful tips and step-by-step instructions, this latest edition will guide you through both basic and advanced features, enabling you to take full advantage of everything Acrobat 8 has to offer. Create, collect, and distribute forms with LiveCycle® Designer Work seamlessly with Microsoft® Office applications Convert AutoCAD® and Visio® files to PDF Discover new ways to edit PDFs and remove sensitive data Explore enhanced Shared Reviews tools with easy-to-use Wizard Collect form data by exporting it directly to Microsoft Excel® Combine files and create PDF Packages using new Acrobat 8 tools What's on the CD-ROM? You'll find valuable, author-developed sample files including PDF documents, Adobe Designer forms, and Acrobat PDF forms with JavaScripts—all arranged in folders according to chapters in the book, so you use them along with the book's tutorials. The

CD also includes: Adobe Reader software Entire book in searchable PDF with embedded index Windows demonstration plug-ins

PUTTING SYSTEMS TO WORK

John Wiley & Sons Incorporated The author presents a radical approach to both systems thinking and systems practice. Instead of the "soft" and "hard" schisms, he visualizes these notions as ends of a continuous spectrum running from the fuzzy and uncertain, to the firm and well structured. His theory, Unified System Hypothesis, provides both a bridge between soft and hard systems thinking, and practical methods, tools, and techniques. Illustrated with many case studies. Topics include chaos, the human element, creativity, and systems architecture. Annotation copyright by Book News, Inc., Portland, OR

MATHEMATICAL MODELLING AND COMPUTER SIMULATION OF ACTIVATED SLUDGE SYSTEMS

IWA Publishing Mathematical Modelling and Computer Simulation of Activated Sludge Systems – Second Edition provides, from the process engineering perspective, a comprehensive and up-to-date overview regarding various aspects of the mechanistic (“white box”) modelling and simulation of advanced activated sludge systems performing biological nutrient removal. In the new edition of the book, a special focus is given to nitrogen removal and the latest developments in modelling the innovative nitrogen removal processes. Furthermore, a new section on micropollutant removal has been added. The focus of modelling has been shifting in the last years to models that can describe the performance of a whole plant (plant-wide modelling). The expanded part of this new edition introduces models describing the most important processes interrelated with the mainstream activated sludge systems as well as models describing the energy balance, operating costs and environmental impact. The complex process evaluation, including minimization of energy consumption and carbon footprint, is in line with the present and future wastewater treatment goals. By combining a general introduction and a textbook, this book serves both intermediate and more experienced model users, both researchers and practitioners, as a comprehensive guide to modelling and simulation studies. The book can be used as a supplemental material at graduate and post-graduate levels of wastewater engineering/modelling courses.

REINFORCEMENT LEARNING, SECOND EDITION

AN INTRODUCTION

MIT Press The significantly expanded and updated new edition of a widely used text on reinforcement learning, one of the most active research areas in artificial intelligence. Reinforcement learning, one of the most active research areas in artificial intelligence, is a

computational approach to learning whereby an agent tries to maximize the total amount of reward it receives while interacting with a complex, uncertain environment. In Reinforcement Learning, Richard Sutton and Andrew Barto provide a clear and simple account of the field's key ideas and algorithms. This second edition has been significantly expanded and updated, presenting new topics and updating coverage of other topics. Like the first edition, this second edition focuses on core online learning algorithms, with the more mathematical material set off in shaded boxes. Part I covers as much of reinforcement learning as possible without going beyond the tabular case for which exact solutions can be found. Many algorithms presented in this part are new to the second edition, including UCB, Expected Sarsa, and Double Learning. Part II extends these ideas to function approximation, with new sections on such topics as artificial neural networks and the Fourier basis, and offers expanded treatment of off-policy learning and policy-gradient methods. Part III has new chapters on reinforcement learning's relationships to psychology and neuroscience, as well as an updated case-studies chapter including AlphaGo and AlphaGo Zero, Atari game playing, and IBM Watson's wagering strategy. The final chapter discusses the future societal impacts of reinforcement learning.

POST TREATMENTS OF ANAEROBICALLY TREATED EFFLUENTS

IWA Publishing The anaerobic process is considered to be a sustainable technology for organic waste treatment mainly due to its lower energy consumption and production of residual solids coupled with the prospect of energy recovery from the biogas generated. However, the anaerobic process cannot be seen as providing the 'complete' solution as its treated effluents would typically not meet the desired discharge limits in terms of residual carbon, nutrients and pathogens. This has given impetus to subsequent post treatment in order to meet the environmental legislations and protect the receiving water bodies and environment. This book discusses anaerobic treatment from the perspective of organic wastes and wastewaters (municipal and industrial) followed by various post-treatment options for anaerobic effluent polishing and resource recovery. Coverage will also be from the perspective of future trends and thoughts on anaerobic technologies being able to support meeting the increasingly stringent disposal standards. The resource recovery angle is particularly interesting as this can arguably help achieve the circular economy. It is intended the information can be used to identify appropriate solutions for anaerobic effluent treatment and possible alternative approaches to the commonly applied post-treatment techniques. The succeeding discussion is intended to lead on to identification of opportunities for further research and development. This book can be used as a standard reference book and textbook in universities for Master and Doctoral students. The academic community relevant to the subject, namely faculty, researchers, scientists, and practicing engineers, will find the book both informative and as a useful source of successful case studies.

KNOWLEDGE ENGINEERING AND MANAGEMENT

THE COMMONKADS METHODOLOGY

MIT Press The book covers in an integrated fashion the complete route from corporate knowledge management, through knowledge analysis and engineering, to the design and implementation of knowledge-intensive information systems. The disciplines of knowledge engineering and knowledge management are closely tied. Knowledge engineering deals with the development of information systems in which knowledge and reasoning play pivotal roles. Knowledge management, a newly developed field at the intersection of computer science and management, deals with knowledge as a key resource in modern organizations. Managing knowledge within an organization is inconceivable without the use of advanced information systems; the design and implementation of such systems pose great organization as well as technical challenges. The book covers in an integrated fashion the complete route from corporate knowledge management, through knowledge analysis and engineering, to the design and implementation of knowledge-intensive information systems. The CommonKADS methodology, developed over the last decade by an industry-university consortium led by the authors, is used throughout the book. CommonKADS makes as much use as possible of the new UML notation standard. Beyond information systems applications, all software engineering and computer systems projects in which knowledge plays an important role stand to benefit from the CommonKADS methodology.

BATCH PROCESSING SYSTEMS ENGINEERING

FUNDAMENTALS AND APPLICATIONS FOR CHEMICAL ENGINEERING

Springer Science & Business Media Batch chemical processing has in the past decade enjoyed a return to respectability as a valuable, effective, and often preferred mode of process operation. This book provides the first comprehensive and authoritative coverage that reviews the state of the art development in the field of batch chemical systems engineering, applications in various chemical industries, current practice in different parts of the world, and future technical challenges. Developments in enabling computing technologies such as simulation, mathematical programming, knowledge based systems, and prognosis of how these developments would impact future progress in the batch domain are covered. Design issues for complex unit processes and batch plants as well as operational issues such as control and scheduling are also addressed.

THE ELEMENTS OF COMPUTING SYSTEMS

BUILDING A MODERN COMPUTER FROM FIRST PRINCIPLES

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

ANCILLARY EQUIPMENT AND ELECTRICAL EQUIPMENT - VOLUME I

Ancillary Equipment and Electrical Equipment is a component of Encyclopedia of Water Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The volume presents state-of-the art subject matter of various aspects of Ancillary Equipment And Electrical Equipment such as: Seawater Supply Pump; Cooling Water Recirculation Pump; Brine Recirculation Pump; Brine Blowdown Pump; Brine Heater Condensate Pump; Minor Pumps For Desalination Plants; The Installation Criteria And The Layout; Hydraulic Aspects In Design And Operation Of Axial-Flow Pumps; Description Of Surface Vortices With Regard To Common Design Criteria Of Intake Chambers; Vacuum Creating Equipment; Filtering Equipment; Chemical Dosing Stations; On-Load Sponge Ball Cleaning System; Power Supply Systems And Electrical Equipment For Desalination Plants; Composite Materials For Pressure Vessels And Pipes; Thermal Stresses In Vessels, Piping, And Components; Pressure Vessels And Piping Systems: Reliability, Risk And Safety Assessment; Pressure Vessels And Shell Structures; Pipeline Operations; Steel And Pipe Mill Technology; Pipeline Structural Integrity; Pipeline System Automation And Control; Pump And Compressor Operation; Environmental Conservation Practices For Pipelines. This volume is aimed at the following five major target audiences: University and College Students Educators, Professional Practitioners, Research Personnel and Policy and Decision Makers

BENZEL'S SPINE SURGERY

TECHNIQUES, COMPLICATION AVOIDANCE, AND MANAGEMENT

Elsevier Health Sciences Written and edited by world-renowned experts in the field, Benzel's Spine Surgery: Techniques, Complication Avoidance and Management, 5th Edition, provides expert, step-by-step guidance on the evaluation and management of disorders of the spine. This definitive, two-volume work explores the full spectrum of techniques used in spine surgery, giving you the tools you

need to hone your skills and increase your knowledge in this challenging area. Clearly organized and extensively revised throughout, it features contributions from both neurosurgeons and orthopaedic surgeons to present a truly comprehensive approach to spine disease. Offers a thorough overview of the effective management of patients with spinal disorders, including fundamental principles, biomechanics, applied anatomy, instrumentation, pathophysiology of spinal disorders, surgical techniques, motion preservation strategies, non-surgical management, and complication avoidance and management, as well as controversies. Focuses on both pathophysiology and surgical treatment of spine disease, with an increased emphasis on minimally invasive surgery. Contains new features such as key points boxes at the beginning of chapters and algorithms to help streamline the decision making process. Covers today's hot topics in spine surgery, such as health economics, artificial intelligence, predictive analytics, new less invasive techniques including endoscopic spine surgery, and the future of spine surgery. Provides expert coverage of key topics including biomechanics of motion preservation techniques, spinal injuries in sports, biologics in spine fusion surgery, anterior sub-axial cervical fixation and fusion techniques, complex lumbosacropelvic fixation techniques, and many more. Features more than 1,500 high-quality illustrations, as well as new procedural videos on en bloc spondylectomy, minimally invasive endoscopic posterior cervical foraminotomy, cervical total disc replacement, minimally invasive lumbar decompression of stenosis, and more.

BUILDING SECURE AND RELIABLE SYSTEMS

BEST PRACTICES FOR DESIGNING, IMPLEMENTING, AND MAINTAINING SYSTEMS

O'Reilly Media Can a system be considered truly reliable if it isn't fundamentally secure? Or can it be considered secure if it's unreliable? Security is crucial to the design and operation of scalable systems in production, as it plays an important part in product quality, performance, and availability. In this book, experts from Google share best practices to help your organization design scalable and reliable systems that are fundamentally secure. Two previous O'Reilly books from Google—*Site Reliability Engineering* and *The Site Reliability Workbook*—demonstrated how and why a commitment to the entire service lifecycle enables organizations to successfully build, deploy, monitor, and maintain software systems. In this latest guide, the authors offer insights into system design, implementation, and maintenance from practitioners who specialize in security and reliability. They also discuss how building and adopting their recommended best practices requires a culture that's supportive of such change. You'll learn about secure and reliable systems through: Design strategies Recommendations for coding, testing, and debugging practices Strategies to prepare for, respond to, and recover from incidents Cultural best practices that help teams across your organization collaborate effectively

31ST EUROPEAN SYMPOSIUM ON COMPUTER AIDED PROCESS ENGINEERING

ESCAPE-31

Elsevier The 31st European Symposium on Computer Aided Process Engineering: ESCAPE-31, Volume 50 contains the papers presented at the 31st European Symposium of Computer Aided Process Engineering (ESCAPE) event held in Istanbul, Turkey. It is a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students and consultants in the chemical industries. Presents findings and discussions from the 31st European Symposium of Computer Aided Process Engineering (ESCAPE) event

BLIND EQUALIZATION AND SYSTEM IDENTIFICATION

BATCH PROCESSING ALGORITHMS, PERFORMANCE AND APPLICATIONS

Springer Science & Business Media Discrete-time signal processing has had a momentous impact on advances in engineering and science over recent decades. The rapid progress of digital and mixed-signal integrated circuits in processing speed, functionality and cost-effectiveness has led to their ubiquitous employment in signal processing and transmission in diverse milieux. The absence of training or pilot signals from many kinds of transmission – in, for example, speech analysis, seismic exploration and texture image analysis – necessitates the widespread use of blind equalization and system identification. There have been a great many algorithms developed for these purposes, working with one- or two-dimensional (2-d) signals and with single-input single-output (SISO) or multiple-input multiple-output (MIMO), real or complex systems. It is now time for a unified treatment of this subject, pointing out the common characteristics and the sometimes close relations of these algorithms as well as learning from their different perspectives. Blind Equalization and System Identification provides such a unified treatment presenting theory, performance analysis, simulation, implementation and applications. Topics covered include: • SISO, MIMO and 2-d non-blind equalization (deconvolution) algorithms; • SISO, MIMO and 2-d blind equalization (deconvolution) algorithms; • SISO, MIMO and 2-d blind system identification algorithms; • algorithm analyses and improvements; • applications of SISO, MIMO and 2-d blind equalization/identification algorithms. Each chapter is completed by exercises and computer assignments designed to further understanding and to give practical experience with the algorithms discussed. This is a textbook for graduate-level courses in discrete-time random processes, statistical signal processing, and blind equalization and system identification. It contains material which will also interest researchers and practicing engineers working in digital communications, source separation, speech processing, image processing, seismic exploration, sonar, radar and

other, similar applications.

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Wiley * One of the most authoritative and comprehensive books on Adobe's Acrobat and PDF (Portable Document Format) by the leading Acrobat guru, enhanced and expanded to cover the latest release of Acrobat * Features complete coverage of using Acrobat and PDF for print prepress, the Internet, CD-ROMs, and all the new media * Packed with real-world insights and techniques gained from the author's daily use of Acrobat and PDF under deadline situations * Acrobat and its file format, PDF, have become the standard for portable documents, including everything from high-resolution color files destined for print to Internet and e-book content; more than 200 million copies of Acrobat Reader have been downloaded for use on all popular operating systems * CD-ROM features an interactive, bookmarked, and indexed Acrobat interface, a searchable PDF version of the book, and scores of useful plug-ins and trial software

ENGINEERING EDUCATION FOR A SMART SOCIETY

WORLD ENGINEERING EDUCATION FORUM & GLOBAL ENGINEERING DEANS COUNCIL 2016

Springer This book presents selected papers from the 'World Engineering Education Forum & Global Engineering Deans Council,' held in November 2016 in Seoul, Korea. The massive changes currently underway in all areas of society, especially in engineering (and consequently in engineering education), call for new pedagogic qualifications and approaches. To face these current real-world challenges, higher education has to find innovative ways to quickly respond to these new needs. The papers gathered here address three essential problems:- The main approach to engineering in the 21st century is collaboration - at many levels, within universities or colleges, between institutions, and on a global scale. At the same time, we need a new quality of collaboration between academia, industry, professional and governmental organizations. - The complexity of engineering projects and solutions is rapidly growing, and increasingly includes non-technical aspects. - One of the key tasks for future engineers will be the development of a sustainable society, which is essential to keeping the global environment in balance.

INDUSTRIAL SCALE SUSPENSION CULTURE OF LIVING CELLS

John Wiley & Sons The submersed cultivation of organisms in sterile containments or fermenters has become the standard manufacturing procedure, and will remain the gold standard for some time to come. This book thus addresses submersed cell culture

and fermentation and its importance for the manufacturing industry. It goes beyond expression systems and integrally investigates all those factors relevant for manufacturing using suspension cultures. In so doing, the contributions cover all industrial cultivation methods in a comprehensive and comparative manner, with most of the authors coming from the industry itself. Depending on the maturity of the technology, the chapters address in turn the expression system, basic process design, key factors affecting process economics, plant and bioreactor design, and regulatory aspects.

REVIEW AND EVALUATION OF ALTERNATIVE CHEMICAL DISPOSAL TECHNOLOGIES

National Academies Press In 1994 the National Research Council published Recommendations for the Disposal of Chemical Agents and Munitions, which assessed the status of various alternative destruction technologies in comparison to the Army's baseline incineration system. The volume's main finding was that no alternative technology was preferable to incineration but that work should continue on the neutralization technologies under Army consideration. In light of the fact that alternative technologies have evolved since the 1994 study, this new volume evaluates five Army-chosen alternatives to the baseline incineration system for the disposal of the bulk nerve and mustard agent stored in ton containers at Army sites located in Newport, Indiana, and Aberdeen, Maryland, respectively. The committee assessed each technology by conducting site visits to the locations of the technology proponent companies and by meeting with state regulators and citizens of the affected areas. This volume makes recommendations to the Army on which, if any, of the five technologies has reached a level of maturity appropriate for consideration for pilot-scale testing at the two affected sites.

MICRO PROCESS ENGINEERING, 3 VOLUME SET

A COMPREHENSIVE HANDBOOK

John Wiley & Sons This three-volume handbook provides an overview of the key aspects of micro process engineering. Volume 1 covers the fundamentals, operations and catalysts, volume 2 examines devices, reactions and applications, with volume 3 rounding off the trilogy with system, process and plant engineering. Fluid dynamics, mixing, heat/mass transfer, purification and separation microstructured devices and microstructured reactors are explained in the first volume. Volume 2 segments microreactor design, fabrication and assembly, bulk and fine chemistry, polymerisation, fuel processing and functional materials into understandable parts. The final volume of the handbook addresses microreactor systems design and scale-up, sensing, analysis and control, chemical process engineering, economic and eco-efficiency analyses as well as microreactor plant case studies in one book. Together, this 3-volume handbook explains the science behind micro process engineering to the scale-up and their real life industrial applications.

STATISTICS AND PROBABILITY FOR ENGINEERING APPLICATIONS

Elsevier Statistics and Probability for Engineering Applications provides a complete discussion of all the major topics typically covered in a college engineering statistics course. This textbook minimizes the derivations and mathematical theory, focusing instead on the information and techniques most needed and used in engineering applications. It is filled with practical techniques directly applicable on the job. Written by an experienced industry engineer and statistics professor, this book makes learning statistical methods easier for today's student. This book can be read sequentially like a normal textbook, but it is designed to be used as a handbook, pointing the reader to the topics and sections pertinent to a particular type of statistical problem. Each new concept is clearly and briefly described, whenever possible by relating it to previous topics. Then the student is given carefully chosen examples to deepen understanding of the basic ideas and how they are applied in engineering. The examples and case studies are taken from real-world engineering problems and use real data. A number of practice problems are provided for each section, with answers in the back for selected problems. This book will appeal to engineers in the entire engineering spectrum (electronics/electrical, mechanical, chemical, and civil engineering); engineering students and students taking computer science/computer engineering graduate courses; scientists needing to use applied statistical methods; and engineering technicians and technologists. * Filled with practical techniques directly applicable on the job * Contains hundreds of solved problems and case studies, using real data sets * Avoids unnecessary theory

PROCESS ENGINEERING AND INDUSTRIAL MANAGEMENT

John Wiley & Sons Process Engineering, the science and art of transforming rawmaterials and energy into a vast array of commercial materials, wasconceived at the end of the 19th Century. Its history in the roleof the Process Industries has been quite honorable, and techniquesand products have contributed to improve health, welfare andquality of life. Today, industrial enterprises, which are still amajor source of wealth, have to deal with new challenges in aglobal world. They need to reconsider their strategy taking intoaccount environmental constraints, social requirements, profit,competition, and resource depletion. "Systems thinking" is a prerequisite from procesdevelopment at the lab level to good project management. Newmanufacturing concepts have to be considered, taking into accountLCA, supply chain management, recycling, plant flexibility,continuous development, process intensification andinnovation. This book combines experience from academia and industry in thefield of industrialization, i.e. in all processes involved in theconversion of research into successful operations. Enterprises arefacing major challenges in a world of fierce competition andglobalization. Process engineering techniques provide ProcessIndustries with the necessary tools to cope with these issues. Thechapters of this book give a new approach to the management oftechnology, projects and manufacturing. Contents Part 1: The Company as of Today 1. The Industrial Company: its Purpose, History, Context, and itsTomorrow?, Jean-Pierre Dal Pont. 2. The Two

Modes of Operation of the Company - Operational and Entrepreneurial, Jean-Pierre Dal Pont. 3. The Strategic Management of the Company: Industrial Aspects, Jean-Pierre Dal Pont. Part 2: Process Development and Industrialization 4. Chemical Engineering and Process Engineering, Jean-Pierre Dal Pont. 5. Foundations of Process Industrialization, Jean-François Joly. 6. The Industrialization Process: Preliminary Projects, Jean-Pierre Dal Pont and Michel Royer. 7. Lifecycle Analysis and Eco-Design: Innovation Tools for Sustainable Industrial Chemistry, Sylvain Caillol. 8. Methods for Design and Evaluation of Sustainable Processes and Industrial Systems, Catherine Azzaro-Pantel. 9. Project Management Techniques: Engineering, Jean-Pierre Dal Pont. Part 3: The Necessary Adaptation of the Company for the Future 10. Japanese Methods, Jean-Pierre Dal Pont. 11. Innovation in Chemical Engineering Industries, Oliver Potier and Mauricio Camargo. 12. The Place of Intensified Processes in the Plant of the Future, Laurent Falk. 13. Change Management, Jean-Pierre Dal Pont. 14. The Plant of the Future, Jean-Pierre Dal Pont.

INTRODUCTION TO INFORMATION RETRIEVAL

Cambridge University Press Class-tested and coherent, this textbook teaches classical and web information retrieval, including web search and the related areas of text classification and text clustering from basic concepts. It gives an up-to-date treatment of all aspects of the design and implementation of systems for gathering, indexing, and searching documents; methods for evaluating systems; and an introduction to the use of machine learning methods on text collections. All the important ideas are explained using examples and figures, making it perfect for introductory courses in information retrieval for advanced undergraduates and graduate students in computer science. Based on feedback from extensive classroom experience, the book has been carefully structured in order to make teaching more natural and effective. Slides and additional exercises (with solutions for lecturers) are also available through the book's supporting website to help course instructors prepare their lectures.