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Chicano School Failure and Success

This book presents the latest trends in attacks and protection methods of Critical Infrastructures. It describes original research models and applied solutions for protecting major emerging threats in Critical Infrastructures and their underlying networks. It presents a number of emerging endeavors, from newly adopted technical expertise in industrial security to efficient modeling and implementation of attacks and relevant security measures in industrial control systems; including advancements in hardware and services security, interdependency networks, risk analysis, and control systems security along with their underlying protocols. Novel attacks against Critical Infrastructures (CI) demand novel security solutions. Simply adding more of what is done already (e.g. more thorough risk assessments, more expensive Intrusion Prevention/Detection Systems, more efficient firewalls, etc.) is simply not enough against threats and attacks that seem to have evolved beyond modern analyses and protection methods. The knowledge presented here will help Critical Infrastructure authorities, security officers, Industrial Control Systems (ICS) personnel and relevant researchers to (i) get acquainted with advancements in the field, (ii) integrate security research into their industrial or research work, (iii) evolve current practices in modeling and analyzing Critical Infrastructures, and (iv) moderate potential crises and emergencies influencing or emerging from Critical Infrastructures.

Open-Source Electronics Platforms

The focus of this book is to present the latest aspects in the area of human behavior and its relation to planning of an optimal traffic safety. The contributions from authors in various disciplines such as scientists, medical practitioners, administrators and practitioners from the car industry examine how road-user behavior can cause accidents and how decision-makers from various sectors of society may influence road users' behavior. The development of modern vehicles and new traffic systems requires more sophisticated behavior and technology. New medical technologies such as improved neuropsychologic methods and descriptive mapping of behavior with imaging techniques facilitate the understanding of the anatomy and physiology of human behavior. The increased knowledge of normal and pathologic behavior contributes to strengthen primary prevention with the goal of reducing traffic accidents.

Automation for Robotics

A hands-on book which begins by setting the context;- defining 'fermentation' and the possible uses of fermenters, and setting the scope for the book. It then proceeds in a methodical manner to cover the equipment for research scale fermentation labs, the different types of fermenters available, their uses and modes of operation. Once the lab is equipped, the issues of fermentation media, preservation strains and strain improvement strategies are documented, along with the use of mathematical modelling as a method for prediction and control. Broader questions such as scale-up and scale down, process monitoring and data logging and acquisition are discussed before separate chapters on animal cell culture systems and plant cell culture systems. The final chapter documents the way forward for fermenters and how they can be used for non-manufacturing purposes. A glossary of terms at the back of the book (along with a subject index) will prove invaluable for quick reference. Edited by academic consultants who have years of experience in fermentation technology, each chapter is authored by experts from both industry and academia. Industry authors come from GSK (UK), DSM (Netherlands), Eli Lilly (USA) and Broadley James (UK-USA).

Robot Operating System (ROS)

Does mental disorder cause crime? Does crime cause mental disorder? And if either of these could be proved to be true what consequences should stem for those who find themselves deemed mentally disordered offenders? Mental Health and Crime examines the nature of the relationship between mental disorder and crime. It concludes that the broad definition of what is an all too common human condition - mental disorder - and the widespread occurrence of an equally all too common human behaviour - that of offending - would make unlikely any definitive or easy answer to such questions. For those who offend in the context of mental disorder, many aspects of the criminal justice process, and of the disposals that

follow, are adapted to take account of a relationship between mental disorder and crime. But if the very relationship is questionable, is the way in which we deal with such offenders discriminatory? Or is it perhaps to their benefit to be thought of as less responsible for their offending than fully culpable offenders? The book thus explores not only the nature of the relationship, but also the human rights and legal issues arising. It also looks at some of the permutations in the therapeutic process that can ensue when those with mental health problems are treated in the context of their offending behaviour.

Real-Time Optimization

Make a Raspberry-Pi Controlled Robot teaches you how to build a capable and upgradeable personal robot for around \$100. You'll learn how to control servos, respond to sensor input, and know where your bot is using GPS. You'll also learn many ways to connect to your robot and send it instructions, from an SSH connection to sending text messages from your phone.

Persistent Forecasting of Disruptive Technologies

Literacy research has continued to develop at a rapid pace in these last five years of the millennium. New ideas about how children learn to read have led to a better understanding of the causes of progress and failure in the mastery of literacy, with repercussions for children's assessment and teacher education. These new discoveries also allow teachers to transcend the old debates in reading instruction (phonics versus whole language) and offer the path to a synthesis. At the same time, research with teachers about their own implementation of methods and the development of their own knowledge about the teaching of literacy has produced a fresh analysis of the practice of literacy teaching. Inspired by these developments, teachers, teacher educators and researchers worked together to produce this volume, which promotes the integration of literacy research and practice.

Plant-Microbe Interaction: An Approach to Sustainable Agriculture

Design Recommendations for Intelligent Tutoring Systems explores the impact of computer-based tutoring system design on education and training. Specifically, this volume, "Learner Modeling" examines the fundamentals of learner modeling and identifies best practices, emerging concepts and future needs to promote efficient and effective tutoring. Part of our design recommendations include current, projected, and needed capabilities within the Generalized Intelligent Framework for Tutoring (GIFT), an open source, modular, service-oriented architecture developed to promote simplified authoring, reuse, standardization, automated instruction and evaluation of tutoring technologies.

Industry 4.0 for SMEs

This book brings together a group of visionaries and technical experts from academia to industry to discuss the applications and technologies that will comprise the next set of cellular advancements (5G). In particular, the authors explore usages for future 5G communications, key metrics for these usages with their target requirements, and network architectures and enabling technologies to meet 5G requirements. The objective is to provide a comprehensive guide on the emerging trends in mobile applications, and the challenges of supporting such applications with 4G technologies.

The AI Advantage

For modeling the transport of carriers in nanoscale devices, a Green-function formalism is the most accurate approach. Due to the complexity of the formalism, one should have a deep understanding of the underlying principles and use smart approximations and numerical methods for solving the kinetic equations at a reasonable computational time. In this book the required concepts from quantum and statistical mechanics and numerical methods for calculating Green functions are presented. The Green function is studied in detail for systems both under equilibrium and under nonequilibrium conditions. Because the formalism enables rigorous modeling of different scattering mechanisms in terms of self-energies, but an exact evaluation of self-energies for realistic systems is not possible, their approximation and inclusion in the quantum kinetic equations of the Green functions are elaborated. All the elements of the kinetic equations, which are the device Hamiltonian, contact self-energies and scattering self-energies, are examined and efficient methods for their evaluation are explained. Finally, the application of these methods to study novel electronic devices such as nanotubes, graphene, Si-nanowires and low-dimensional thermoelectric devices and photodetectors are discussed.

Building a Programmable Logic Controller with a PIC16F648A Microcontroller

This book describes new theories and applications of artificial neural networks, with a special focus on answering questions in neuroscience, biology and biophysics and cognitive research. It covers a wide range of methods and technologies, including deep neural networks, large scale neural models, brain computer interface, signal processing methods, as well as models of perception, studies on emotion recognition, self-organization and many more. The book includes both selected and invited papers presented at the XXI International Conference on Neuroinformatics, held on October 7-11, 2019, in Dolgoprudny, a town in Moscow region, Russia.

SAS(R) 9. 1 Macro Language

Collects and defines the programming languages' statements, procedures, and functions, covering syntax, standard code conventions, differences of operation, data type, undocumented behaviors, and practical applications

Autonomous Horizons

Fieldbus Technology (FT) is an enabling platform that is becoming the preferred choice for the next generation real-time automation and control solutions. This book incorporates a selection of research and development papers. Topics covered include: history and background, contemporary standards, underlying architecture, comparison between different Fieldbus systems, applications, latest innovations, new trends as well as issues such as compatibility, interoperability, and interchangeability.

Physical Chemistry of Macromolecules

This open access book explores the concept of Industry 4.0, which presents a considerable challenge for the production and service sectors. While digitization initiatives are usually integrated into the central corporate strategy of larger companies, smaller firms often have problems putting Industry 4.0 paradigms into practice. Small and medium-sized enterprises (SMEs) possess neither the human nor financial resources to systematically investigate the potential and risks of introducing Industry 4.0. Addressing this obstacle, the international team of authors focuses on the development of smart manufacturing concepts, logistics solutions and managerial models specifically for SMEs. Aiming to provide methodological frameworks and pilot solutions for SMEs during their digital transformation, this innovative and timely book will be of great use to scholars researching technology management, digitization and small business, as well as practitioners within manufacturing companies.

VB & VBA in a Nutshell: The Language

This book is a printed edition of the Special Issue "Real-Time Optimization" that was published in Processes

Industrial Controls and Manufacturing

This book is the fifth volume in the successful book series Robot Operating System: The Complete Reference. The objective of the book is to provide the reader with comprehensive coverage on the Robot Operating System (ROS), which is currently considered to be the primary development framework for robotics applications, and the latest trends and contributing systems. The content is divided into six parts. Part I presents for the first time the emerging ROS 2.0 framework, while Part II focuses on multi-robot systems, namely on SLAM and Swarm coordination. Part III provides two chapters on autonomous systems, namely self-driving cars and unmanned aerial systems. In turn, Part IV addresses the contributions of simulation frameworks for ROS. In Part V, two chapters explore robotic manipulators and legged robots. Finally, Part VI presents

emerging topics in monocular SLAM and a chapter on fault tolerance systems for ROS. Given its scope, the book will offer a valuable companion for ROS users and developers, helping them deepen their knowledge of ROS capabilities and features.

AMST'05 Advanced Manufacturing Systems and Technology

The creation of ever more realistic 3-D images is central to the development of computer graphics. The ray tracing technique has become one of the most popular and powerful means by which photo-realistic images can now be created. The simplicity, elegance and ease of implementation makes ray tracing an essential part of understanding and exploiting state-of-the-art computer graphics. An Introduction to Ray Tracing develops from fundamental principles to advanced applications, providing "how-to" procedures as well as a detailed understanding of the scientific foundations of ray tracing. It is also richly illustrated with four-color and black-and-white plates. This is a book which will be welcomed by all concerned with modern computer graphics, image processing, and computer-aided design. Provides practical "how-to" information. Contains high quality color plates of images created using ray tracing techniques. Progresses from a basic understanding to the advanced science and application of ray tracing.

Fieldbus Technology

Increase the modularity, flexibility, and maintainability of your SAS code with the SAS macro facility. This comprehensive reference provides complete information about macro language elements, interfaces between the macro facility and other parts of SAS software, and macro processing in general. With this title, you will learn how to create efficient and portable macro code, reduce the amount of text needed for common tasks, integrate macros with other parts of your SAS programs, and debug macros during development. This title is also available online. To take advantage of this book, you should have at least an intermediate knowledge of Base SAS programming. Supports releases 9.1 and higher of SAS software.

Learning to Read: An Integrated View from Research and Practice

The Institute of Food Technologists (IFT) recently endorsed the use of computers in food science education. The minimum standards for degrees in food science, as suggested by IFT, "require the students to use computers in the solution of problems, the collection and analysis of data, the control processes, in addition to word processing." Because they are widely used in business, allow statistical and graphical of experimental data, and can mimic laboratory experimentation, spreadsheets provide an ideal tool for learning the important features of computers and programming. In addition, they are ideally suited for food science students, who usually do not have an extensive mathematical background. Drawing from the many courses he has taught at UC Davis, Dr. Singh covers the general basics of spreadsheets using examples specific to

food science. He includes more than 50 solved problems drawn from key areas of food science, namely food microbiology, food chemistry, sensory evaluation, statistical quality control, and food engineering. Each problem is presented with the required equations and detailed steps necessary for programming the spreadsheet. Helpful hints in using the spreadsheets are also provided throughout the text. Key Features * The first book to integrate spreadsheets in teaching food science and technology * Includes more than 50 solved examples of spreadsheet use in food science and engineering * Presents a step-by-step introduction to spreadsheet use * Provides a food composition database on a computer disk

Computer Applications in Food Technology

Seagrasses are a vital and widespread but often overlooked coastal marine habitat. This volume provides a global survey of their distribution and conservation status.

Vehicular Networking

Growing numbers of engineering graduates are finding employment in the control systems area with applications to manufacturing. To be properly prepared for such positions, it is desirable that the students be exposed to the topics of process control, discrete logic control and the fundamentals of manufacturing. Presently there is no existing textbook and/or reference that combine together process control, discrete logic control and the fundamentals of manufacturing. This is a book that fills that gap. This book integrates together the theory with a number of illustrative examples. Constructive procedures will be given for designing controllers and manufacturing lines, including methods for designing digital controllers, fuzzy logic controllers and adaptive controllers, and methods for the design of the flow of operations in a manufacturing line. One chapter will be devoted to equipment interfacing and computer communications, with the focus on fieldbuses, device drivers and computer networks. There are no existing control-oriented textbooks that bring this material into the picture, although interfacing and communications are becoming a bigger and bigger part of the overall control problem. Covers both analog and digital control using P/PI/PID controllers and discrete logic control using ladder logic diagrams and programmable logic controllers Contains a brief introduction to model predictive control, adaptive control, and neural net control Covers control from the device/process level up to and including the production system level Contains an introduction to manufacturing systems with the emphasis on performance measures, flow-line analysis, and line balancing Contains a chapter on equipment interfacing with a brief introduction on OLE for process control (OPC), the GEM standard, fieldbuses, and Ethernet Material is based on a course with a lab project developed and taught at the Georgia Institute of Technology Coverage is at the introductory level with a minimal amount of background required to read the text

Make a Raspberry Pi-Controlled Robot

Cutting through the hype, a practical guide to using artificial intelligence for business benefits and competitive advantage. In *The AI Advantage*, Thomas Davenport offers a guide to using artificial intelligence in business. He describes what technologies are available and how companies can use them for business benefits and competitive advantage. He cuts through the hype of the AI craze--remember when it seemed plausible that IBM's Watson could cure cancer?--to explain how businesses can put artificial intelligence to work now, in the real world. His key recommendation: don't go for the "moonshot" (curing cancer, or synthesizing all investment knowledge); look for the "low-hanging fruit" to make your company more efficient. Davenport explains that the business value AI offers is solid rather than sexy or splashy. AI will improve products and processes and make decisions better informed--important but largely invisible tasks. AI technologies won't replace human workers but augment their capabilities, with smart machines to work alongside smart people. AI can automate structured and repetitive work; provide extensive analysis of data through machine learning ("analytics on steroids"), and engage with customers and employees via chatbots and intelligent agents. Companies should experiment with these technologies and develop their own expertise. Davenport describes the major AI technologies and explains how they are being used, reports on the AI work done by large commercial enterprises like Amazon and Google, and outlines strategies and steps to becoming a cognitive corporation. This book provides an invaluable guide to the real-world future of business AI. A book in the *Management on the Cutting Edge* series, published in cooperation with MIT Sloan Management Review.

Transboundary Water Resources Management

MOST (Media Oriented Systems Transport) is a multimedia network technology developed to enable an efficient transport of streaming, packet and control data in an automobile. It is the communication backbone of an infotainment system in a car. MOST can also be used in other product areas such as driver assistance systems and home applications.

Mental Health and Crime

First published in 1991. Routledge is an imprint of Taylor & Francis, an informa company.

MOST

This book provides an introduction to the mathematics needed to model, analyze, and design feedback systems. It is an ideal textbook for undergraduate and graduate students, and is indispensable for researchers seeking a self-contained

reference on control theory. Unlike most books on the subject, Feedback Systems develops transfer functions through the exponential response of a system, and is accessible across a range of disciplines that utilize feedback in physical, biological, information, and economic systems. Karl Åström and Richard Murray use techniques from physics, computer science, and operations research to introduce control-oriented modeling. They begin with state space tools for analysis and design, including stability of solutions, Lyapunov functions, reachability, state feedback observability, and estimators. The matrix exponential plays a central role in the analysis of linear control systems, allowing a concise development of many of the key concepts for this class of models. Åström and Murray then develop and explain tools in the frequency domain, including transfer functions, Nyquist analysis, PID control, frequency domain design, and robustness. They provide exercises at the end of every chapter, and an accompanying electronic solutions manual is available. Feedback Systems is a complete one-volume resource for students and researchers in mathematics, engineering, and the sciences. Covers the mathematics needed to model, analyze, and design feedback systems Serves as an introductory textbook for students and a self-contained resource for researchers Includes exercises at the end of every chapter Features an electronic solutions manual Offers techniques applicable across a range of disciplines

Automotive User Interfaces

This book focuses on automotive user interfaces for in-vehicle usage, looking at car electronics, its software of hidden technologies (e.g., ASP, ESP), comfort functions (e.g., navigation, communication, entertainment) and driver assistance (e.g., distance checking). The increased complexity of automotive user interfaces, driven by the need for using consumer electronic devices in cars as well as autonomous driving, has sparked a plethora of new research within this field of study. Covering a broad spectrum of detailed topics, the authors of this edited volume offer an outstanding overview of the current state of the art; providing deep insights into usability and user experience, interaction techniques and technologies as well as methods, tools and its applications, exploring the increasing importance of Human-Computer-Interaction (HCI) within the automotive industry Automotive User Interfaces is intended as an authoritative and valuable resource for professional practitioners and researchers alike, as well as computer science and engineering students who are interested in automotive interfaces.

Towards 5G

Dr. Greg Zacharias, former Chief Scientist of the United States Air Force (2015-18), explores next steps in autonomous systems (AS) development, fielding, and training. Rapid advances in AS development and artificial intelligence (AI) research will change how we think about machines, whether they are individual vehicle platforms or networked enterprises. The payoff will be considerable, affording the US military significant protection for aviators, greater effectiveness in

employment, and unlimited opportunities for novel and disruptive concepts of operations. *Autonomous Horizons: The Way Forward* identifies issues and makes recommendations for the Air Force to take full advantage of this transformational technology.

Transportation, Traffic Safety and Health – Human Behavior

Integrating coverage of polymers and biological macromolecules into a single text, *Physical Chemistry of Macromolecules* is carefully structured to provide a clear and consistent resource for beginners and professionals alike. The basic knowledge of both biophysical and physical polymer chemistry is covered, along with important terms, basic structural properties and relationships. This book includes end of chapter problems and references, and also: Enables users to improve basic knowledge of biophysical chemistry and physical polymer chemistry. Explores fully the principles of macromolecular chemistry, methods for determining molecular weight and configuration of molecules, the structure of macromolecules, and their separations.

An Introduction to Ray Tracing

During the last 15 years, the interest in vehicular communication has grown, especially in the automotive industry. Due to the envisioned mass market, projects focusing on Car-to-X communication experience high public visibility. This book presents vehicular communication in a broader perspective that includes more than just its application to the automotive industry. It provides, researchers, engineers, decision makers and graduate students in wireless communications with an introduction to vehicular communication focussing on car-to-x and train-based systems. Emphasizes important perspectives of vehicular communication including market area, application areas, and standardization issues as well as selected topics featuring aspects of developing, prototyping, and testing vehicular communication systems. Supports the reader in understanding common characteristics and differences between the various application areas of vehicular communication. Offers both an overview of the application area and an in-depth discussion of key technologies in these areas. Written by a wide range of experts in the field.

Micro-Assembly Technologies and Applications

In a world facing a growing water crisis, conflicts regarding water sharing and environmental issues are expected to grow, especially in transboundary river basins, where 40% of the world's population lives. This book represents one of the first attempts to bring together methodologies and analytical tools from socio-economic, international policy, engineering, and water management specialists dealing with transboundary water resources. The book is divided into three parts. Part I

introduces state-of-the-art concepts in institutional policy and conflict analysis. Part II presents engineering approaches and models for transboundary water management and conflict resolution. Part III analyzes cases in international river basins and enclosed seas.

Feedback Systems

This book presents theories and case studies for corporations in developed nations, including Japan, for designing strategies to maximize opportunities and minimize threats in business expansion into developing nations. The case studies featured here focus on Asia, including China and India, and use examples of Japanese manufacturers. Five case studies are provided, including Hitachi Construction Machinery and Shiseido in China and Maruti Suzuki in India. These cases facilitate the reader's understanding of the business environments in emerging economies. This volume is especially recommended for business people responsible for international business development, particularly in China and India. In addition, the book serves as a useful resource for students in graduate-level courses in international management.

Advances in Neural Computation, Machine Learning, and Cognitive Research III

This book examines the school failure and success of Chicano students from a wide variety of perspectives. It attempts to promote further understanding of what constitutes, maintains, and helps shape school failure among Chicano students, and to present research and policy agendas that may help to realize Chicano school success. Five sections address current realities of the Chicano schooling experience, language and classroom perspectives on Chicano achievement, cultural and familial perspectives on achievement, educational testing and special education issues, and the big picture and Chicano school failure. Chapters are: (1) "The Plight of Chicano Students: An Overview of Schooling Conditions and Outcomes" (Richard R. Valencia); (2) "Segregation, Desegregation, and Integration of Chicano Students: Problems and Prospects" (Ruben Donato, Martha Menchaca, Richard R. Valencia); (3) "Chicano Dropouts: A Review of Research and Policy Issues" (Russell W. Rumberger); (4) "Bilingualism, Second Language Acquisition, and the Education of Chicano Language Minority Students" (Eugene E. Garcia); (5) "Promoting School Success for Chicanos: The View from Inside the Bilingual Classroom" (Barbara J. Merino); (6) "From Failure to Success: The Roles of Culture and Cultural Conflict in the Academic Achievement of Chicano Students" (Henry T. Trueba); (7) "Cognitive Socialization and Competence: The Academic Development of Chicanos" (Luis M. Laosa, Ronald W. Henderson); (8) "The Uses and Abuses of Educational Testing: Chicanos as a Case in Point" (Richard R. Valencia, Sofia Aburto); (9) "An Analysis of Special Education as a Response to the Diminished Academic Achievement of Chicano Students" (Robert Rueda); (10) "Systemic and Institutional Factors in Chicano School Failure" (Arthur Pearl); and (11) "Conclusions: Towards Chicano School Success" (Richard R. Valencia). This book contains references in each chapter, 30 data tables and figures, notes on contributors, and author and subject indexes. (SV)

The Non-Equilibrium Green's Function Method for Nanoscale Device Simulation

The book addresses current public concern about the adverse effect of agrochemicals and their effect on the agro-ecosystem. This book also aims to satisfy and contribute to the increasing interest in understanding the co-operative activities among microbial populations and their interaction with plants. It contains chapters on a variety of interrelated aspects of plant-microbe interactions with a single theme of stress management and sustainable agriculture. The book will be very useful for students, academicians, researcher working on plant-microbe interaction and also for policy makers involved in food security and sustainable agriculture.

Chicano School Failure and Success

Manufacturing a product is not difficult, the difficulty consists in manufacturing a product of high quality, at a low cost and rapidly. Drastic technological advances are changing global markets very rapidly. In such conditions the ability to compete successfully must be based on innovative ideas and new products which has to be of high quality yet low in price. One way to achieve these objectives would be through massive investments in research of computer based technology and by applying the approaches presented in this book. The First International Conference on Advanced Manufacturing Systems and Technology AMST87 was held in Opatija (Croatia) in October 1987. The Second International Conference on Advanced Manufacturing Systems and Technology AMSV90 was held in Trento (Italy) in June 1990. The Third, Fourth, Fifth and Sixth Conferences on Advanced Manufacturing Systems and Technology were all held in Udine (Italy) as follows: AMST93 in April 1993, AMST96 in September 1996, AMST99 in June 1999 and AMST02 in June 2002.

Physical Multiscale Modeling and Numerical Simulation of Electrochemical Devices for Energy Conversion and Storage

Technological innovations are key causal agents of surprise and disruption. In the recent past, the United States military has encountered unexpected challenges in the battlefield due in part to the adversary's incorporation of technologies not traditionally associated with weaponry. Recognizing the need to broaden the scope of current technology forecasting efforts, the Office of the Director, Defense Research and Engineering (DDR&E) and the Defense Intelligence Agency (DIA) tasked the Committee for Forecasting Future Disruptive Technologies with providing guidance and insight on how to build a persistent forecasting system to predict, analyze, and reduce the impact of the most dramatically disruptive technologies. The first of two reports, this volume analyzes existing forecasting methods and processes. It then outlines the necessary characteristics of a comprehensive forecasting system that integrates data from diverse sources to identify potentially game-changing technological innovations and facilitates informed decision making by policymakers. The committee's goal

was to help the reader understand current forecasting methodologies, the nature of disruptive technologies and the characteristics of a persistent forecasting system for disruptive technology. Persistent Forecasting of Disruptive Technologies is a useful text for the Department of Defense, Homeland Security, the Intelligence community and other defense agencies across the nation.

Design Recommendations for Intelligent Tutoring Systems

Open-source electronics are becoming very popular, and are integrated with our daily educational and developmental activities. At present, the use open-source electronics for teaching science, technology, engineering, and mathematics (STEM) has become a global trend. Off-the-shelf embedded electronics such as Arduino- and Raspberry-compatible modules have been widely used for various applications, from do-it-yourself (DIY) to industrial projects. In addition to the growth of open-source software platforms, open-source electronics play an important role in narrowing the gap between prototyping and product development. Indeed, the technological and social impacts of open-source electronics in teaching, research, and innovation have been widely recognized.

Critical Infrastructure Security and Resilience

Micro-assembly is a key enabling technology for cost effective manufacture of new generations of complex micro products. It is also a critical technology for retaining industrial capabilities in high labour cost areas such as Europe since up to 80% of the production cost in some industries is attributed directly to assembly processes. With the continuous trend for product miniaturisation, the scientific and technological developments in micro-assembly are expected to have a significant long-term economic, demographic and social impact. A distinctive feature of the process is that surface forces are often dominant over gravity forces, which determines a number of specific technical challenges. Critical areas which are currently being addressed include development of assembly systems with high positional accuracy, micro gripping methods that take into account the adhesive surface forces, high precision micro-feeding techniques and micro-joining processes. Micro-assembly has developed rapidly over the last few years and all the predictions are that it will remain a critical technology for high value products in a number of key sectors such as healthcare, communications, defence and aerospace. The key challenge is to match the significant technological developments with a new generation of micro products that will establish firmly micro-assembly as a core manufacturing process.

World Atlas of Seagrasses

The aim of this book is to review innovative physical multiscale modeling methods which numerically simulate the structure

and properties of electrochemical devices for energy storage and conversion. Written by world-class experts in the field, it revisits concepts, methodologies and approaches connecting ab initio with micro-, meso- and macro-scale modeling of components and cells. It also discusses the major scientific challenges of this field, such as that of lithium-ion batteries. This book demonstrates how fuel cells and batteries can be brought together to take advantage of well-established multi-scale physical modeling methodologies to advance research in this area. This book also highlights promising capabilities of such approaches for inexpensive virtual experimentation. In recent years, electrochemical systems such as polymer electrolyte membrane fuel cells, solid oxide fuel cells, water electrolyzers, lithium-ion batteries and supercapacitors have attracted much attention due to their potential for clean energy conversion and as storage devices. This has resulted in tremendous technological progress, such as the development of new electrolytes and new engineering designs of electrode structures. However, these technologies do not yet possess all the necessary characteristics, especially in terms of cost and durability, to compete within the most attractive markets. Physical multiscale modeling approaches bridge the gap between materials' atomistic and structural properties and the macroscopic behavior of a device. They play a crucial role in optimizing the materials and operation in real-life conditions, thereby enabling enhanced cell performance and durability at a reduced cost. This book provides a valuable resource for researchers, engineers and students interested in physical modelling, numerical simulation, electrochemistry and theoretical chemistry.

Microgrids

Microgrids are the most innovative area in the electric power industry today. Future microgrids could exist as energy-balanced cells within existing power distribution grids or stand-alone power networks within small communities. A definitive presentation on all aspects of microgrids, this text examines the operation of microgrids – their control concepts and advanced architectures including multi-microgrids. It takes a logical approach to overview the purpose and the technical aspects of microgrids, discussing the social, economic and environmental benefits to power system operation. The book also presents microgrid design and control issues, including protection and explaining how to implement centralized and decentralized control strategies. Key features: original, state-of-the-art research material written by internationally respected contributors unique case studies demonstrating success stories from real-world pilot sites from Europe, the Americas, Japan and China examines market and regulatory settings for microgrids, and provides evaluation results under standard test conditions a look to the future – technical solutions to maximize the value of distributed energy along with the principles and criteria for developing commercial and regulatory frameworks for microgrids Offering broad yet balanced coverage, this volume is an entry point to this very topical area of power delivery for electric power engineers familiar with medium and low voltage distribution systems, utility operators in microgrids, power systems researchers and academics. It is also a useful reference for system planners and operators, manufacturers and network operators, government regulators, and postgraduate power systems students. CONTRIBUTORS Thomas Degner Aris Dimeas Alfred Engler Nuno Gil Asier Gil de

Muro Guillermo Jiménez-Estévez George Kariniotakis George Korres André Madureira Meiqin Mao Chris Marnay Jose Miguel Yarza Satoshi Morozumi Alexander Oudalov Frank van Overbeeke Rodrigo Palma Behnke Joao Abel Pecas Lopes Fernanda Resende John Romankiewicz Christine Schwaegerl Nikos Soultanis Liang Tao Antonis Tsikalakis

Practical Fermentation Technology

In order to enable a better understanding of the key concepts of automation, this book develops the fundamental aspects of the field while also proposing numerous concrete exercises and their solutions. The theoretical approach that it presents fundamentally uses the state space and makes it possible to process general and complex systems in a simple way, involving several switches and sensors of different types. This approach requires the use of developed theoretical tools such as linear algebra, analysis and physics, generally taught in preparatory classes for specialist engineering courses.

Global Business Strategy

Programmable logic controllers (PLCs) are extensively used in industry to perform automation tasks, with manufacturers offering a variety of PLCs that differ in functions, program memories, and the number of inputs/outputs (I/O). Not surprisingly, the design and implementation of these PLCs have long been a secret of manufacturers. Unveiling the mysteries of PLC technology, *Building a Programmable Logic Controller with PIC16F648A Microcontroller* explains how to design and use a PIC16F648A-microcontroller-based PLC. The author first described a microcontroller-based implementation of a PLC in a series of articles published in *Electronics World* magazine between 2008 and 2010. This book is based on an improved version of the project, including: Updates to the hardware configuration, with a smaller CPU board and two I/O extension boards that now support 16 inputs and 16 outputs instead of 8 An increased clock frequency of 20 MHz Improvements to several macros Flowcharts to help you understand the macros (functions) In this book, the author provides detailed explanations of hardware and software structures. He also describes PIC Assembly macros for all basic PLC functions, which are illustrated with numerous examples and flowcharts. An accompanying CD contains source files (.ASM) and object files (.HEX) for all of the examples in the book. It also supplies printed circuit board (PCB) (Gerber and .pdf) files so that you can have the CPU board and I/O extension boards produced by a PCB manufacturer or produce your own boards. Making PLCs more easily accessible, this unique book is written for advanced students, practicing engineers, and hobbyists who want to learn how to build their own microcontroller-based PLC. It assumes some previous knowledge of digital logic design, microcontrollers, and PLCs, as well as familiarity with the PIC16F series of microcontrollers and w

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