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This book is a printed edition of the Special Issue "Real-Time Embedded Systems" that was published in Electronics Internet of Things: Connecting Objects puts forward the technologies and the networking architectures which make it possible to support the Internet of Things. Amongst these technologies, RFID, sensor and PLC technologies are described and a clear view on how they enable the Internet of Things is given. This book also provides a good overview of the main issues facing the Internet of Things such as the issues of privacy and security, application and usage, and standardization.

The volume contains 75 papers presented at International Conference on Communication and Networks (COMNET 2015) held during February 19–20, 2016 at Ahmedabad Management Association (AMA), Ahmedabad, India and organized by Computer Society of India (CSI), Ahmedabad Chapter, Division IV and Association of Computing Machinery (ACM), Ahmedabad Chapter. The book aims to provide a forum to researchers to propose theory and technology on the networks and services, share their experience in IT and telecommunications industries and to discuss future management solutions for communication systems, networks and services. It comprises of original contributions from researchers describing their original, unpublished, research contribution. The papers are mainly from 4 areas – Security, Management and Control, Protocol and Deployment, and Applications. The topics covered in the book are newly emerging algorithms, communication systems, network standards, services, and applications.

This authoritative new resource explores the power grid from its classical role as a utility or service provider towards its new role as an application development platform. This book gives insight into the vision, problems and solutions, and risks of the smart grid model. The evolution of the power grid as it develops into an application-centric environment is explained in this book. This resource guides readers to better understand the primary motivation of the smart grid, and to explore how new technologies are creating a cleaner and more sustainable ecosystem for new business models to blossom. Key topics include the basics of electricity and the conventional grid structure, as well as the relationships between conventional economic models and emerging models based on transactive energy and the sharing economy. This book presents the orchestration of smart grid technologies as they are transforming the utility sector toward a human-centric grid. Readers gain insight into how they are playing an active role in the operation of the utility business as well as in the transfer of electrons. This book demonstrates how the new smart grid is becoming a distributed system that supports decentralized services through modern trends and distributed system architectures. Readers learn how grid intelligence and energy production migrates to the edge of the network. This book explores how consumers are transformed to "prosumers" of energy and providers of critical data that are dramatically changing the relationship with the electric utility business in order to enable new applications and services.

Los avances en el internet de las cosas (IoT), así como el disfrute del ocio y el entretenimiento en casa, la automatización, el control, la seguridad y hacer que el hogar sea respetuoso con el medio ambiente, ofrecen un nuevo y amplio abanico profesional. Este libro desarrolla y amplía los contenidos del módulo profesional de Sistemas Integrados y Hogar Digital del Ciclo Formativo de grado superior de Sistemas de Telecomunicaciones e Informáticos de la familia de Electricidad y Electrónica. Sistemas integrados y hogar digital, estructurado en 7 unidades y 2 apéndices, es un completo manual sobre el hogar digital: ---- Ofrece contenido generalista, al no ceñirse a ningún modelo o marca en concreto. ---- Expone los contenidos, lenguajes de programación, conexiones y aparataje de manera que puedan utilizarse cualquiera de los elementos y aparatos existentes en el mercado. ---- Resume la normativa de la manera más clara y concisa posible, sin eliminar detalles importantes y utilizando las leyes, los decretos y las normativas más actuales. ---- Introduce casos prácticos resueltos y actividades que invitan a utilizar nuevos soportes digitales y controladores programables, así como nuevas técnicas educativas para potenciar la innovación. Esta obra está dirigida tanto al alumnado como a profesionales, y cualquier persona interesada en el hogar digital, el internet de las cosas, las comunicaciones, la domótica o la seguridad y las aplicaciones de ocio. Carlos Enrique Ruiz Buitrón, técnico especialista en Electrónica Industrial e ingeniero técnico en Informática de Sistemas, realiza su labor docente en la Formación Profesional Reglada y en la ocupacional, en las familias profesionales de Telecomunicaciones, Electricidad y Administración desde hace más de una década. Además, cuenta con experiencia profesional en las ramas de telecomunicaciones, informática y formación.

Oliver Heath—a star of TV's popular Changing Rooms series and one of today's most exciting decorators—has come up with a magnificent one-stop guide to interiors and individual home design. With his expert advice and color photographs showcasing attractive options, it's easy to plan rooms that fit any budget, need, or desire. Understand the costs and effects of lighting, flooring, and wall finishes, and put it all together so each space has a cohesive style. From adding beautiful, unique touches throughout the house to handling practical concerns (such as hiring contractors and incorporating eco-friendly features), here are the tools every home designer needs.

This book presents current progress on challenges related to Big Data management by focusing on the particular challenges associated with context-aware data-intensive applications and services. The book is a state-of-the-art reference discussing progress made, as well as prompting future directions on the theories, practices, standards and strategies that are related to the emerging computational technologies and their association with supporting the Internet of Things advanced functioning for organizational settings including both business and e-science. Apart from inter-operable and inter-cooperative aspects, the book deals with a notable opportunity namely, the current trend in which a collectively shared and generated content is emerged from Internet end-users. Specifically, the book presents advances on managing and exploiting the vast size of data generated from within the smart environment (i.e. smart cities) towards an integrated, collective intelligence approach. The book also presents methods and practices to improve large storage

infrastructures in response to increasing demands of the data intensive applications. The book contains 19 self-contained chapters that were very carefully selected based on peer review by at least two expert and independent reviewers and is organized into the three sections reflecting the general themes of interest to the IoT and Big Data communities: Section I: Foundations and Principles Section II: Advanced Models and Architectures Section III: Advanced Applications and Future Trends The book is intended for researchers interested in joining interdisciplinary and transdisciplinary works in the areas of Smart Environments, Internet of Things and various computational technologies for the purpose of an integrated collective computational intelligence approach into the Big Data era.

An all-in-one reference to the major Home Area Networking, Building Automation and AMI protocols, including 802.15.4 over radio or PLC, 6LowPAN/RPL, ZigBee 1.0 and Smart Energy 2.0, Zwave, LON, BACNet, KNX, ModBus, mBus, C.12 and DLMS/COSEM, and the new ETSI M2M system level standard. In-depth coverage of Smart-grid and EV charging use cases. This book describes the Home Area Networking, Building Automation and AMI protocols and their evolution towards open protocols based on IP such as 6LowPAN and ETSI M2M. The authors discuss the approach taken by service providers to interconnect the protocols and solve the challenge of massive scalability of machine-to-machine communication for mission-critical applications, based on the next generation machine-to-machine ETSI M2M architecture. The authors demonstrate, using the example of the smartgrid use case, how the next generation utilities, by interconnecting and activating our physical environment, will be able to deliver more energy (notably for electric vehicles) with less impact on our natural resources. Key Features: Offers a comprehensive overview of major existing M2M and AMI protocols Covers the system aspects of large scale M2M and smart grid applications Focuses on system level architecture, interworking, and nationwide use cases Explores recent emerging technologies: 6LowPAN, ZigBee SE 2.0 and ETSI M2M, and for existing technologies covers recent developments related to interworking Relates ZigBee to the issue of smartgrid, in the more general context of carrier grade M2M applications Illustrates the benefits of the smartgrid concept based on real examples, including business cases This book will be a valuable guide for project managers working on smartgrid, M2M, telecommunications and utility projects, system engineers and developers, networking companies, and home automation companies. It will also be of use to senior academic researchers, students, and policy makers and regulators.

Microgrids are poised to play a big role in the electricity ecosystem of the future—with decarbonization, digitalization, decentralization, and non-wires solutions being key attributes. This handbook serves as a guide to evaluate the feasibility of microgrid systems in enhancing power supply quality and connectivity. It includes information about on-grid microgrids for urban and industrial applications, prevailing business models, and emerging trends that could shape the future of this sector.

This book is for anyone who wants to learn Intel Galileo for home automation and cross-platform software development. No knowledge of programming with Intel Galileo is assumed, but knowledge of the C programming language is essential. Las instalaciones domóticas han comenzado a formar parte del ADN de nuestros hogares: un hogar digital conectado, inteligente y adaptado a las necesidades de una nueva sociedad en continuo e incesante cambio y evolución. Este libro desarrolla los contenidos del módulo profesional de Configuración de Instalaciones Domóticas y Automáticas, del Ciclo Formativo de grado superior de Sistemas Electrotécnicos y Automatizados, de la familia profesional de Electricidad y Electrónica. Configuración de instalaciones domóticas y automáticas se ha renovado para que, en esta segunda edición, el lector se aproxime a la evolución que las instalaciones domóticas han sufrido en los últimos años, ayudándole a entender las distintas tecnologías y profundizar en su elección, instalación, puesta en marcha y verificación. La obra es un compendio de las principales tecnologías domóticas existentes en el sector. Se trata de una obra inédita que refleja la necesidad de profundizar en las tecnologías domóticas que cada día se incorporan a nuestros hogares, edificios o ciudades. El calificativo «inteligente» adquiere un nuevo significado, formando parte inherente de los objetos, instalaciones y otros entes que circundan a nuestro alrededor. Dirigida al alumnado de Ciclos Formativos, de Ingenierías e interesados en la temática en general, este libro persigue como objetivo permitir al lector conocer las instalaciones domóticas y las soluciones tecnológicas asociadas que existen en la actualidad, así como su evolución y tendencias.

This book provides a comprehensive overview of the fundamental security of Industrial Control Systems (ICSs), including Supervisory Control and Data Acquisition (SCADA) systems and touching on cyber-physical systems in general. Careful attention is given to providing the reader with clear and comprehensive background and reference material for each topic pertinent to ICS security. This book offers answers to such questions as: Which specific operating and security issues may lead to a loss of efficiency and operation? What methods can be used to monitor and protect my system? How can I design my system to reduce threats? This book offers chapters on ICS cyber threats, attacks, metrics, risk, situational awareness, intrusion detection, and security testing, providing an advantageous reference set for current system owners who wish to securely configure and operate their ICSs. This book is appropriate for non-specialists as well. Tutorial information is provided in two initial chapters and in the beginnings of other chapters as needed. The book concludes with advanced topics on ICS governance, responses to attacks on ICS, and future security of the Internet of Things. In this text Oliver Heath uses original designs that are fresh, modern, and reflect the people who live there, giving their homes a unique and stylish transformation that makes them stand out from the crowd and increases their value.

This book provides a classification of current and future applications for the domain of Cooperating Objects. The book has been created with a very strong participation of the industry and taking into account current research trends and industrial roadmaps

Industrial revolutions have impacted both, manufacturing and service. From the steam engine to digital automated production, the industrial revolutions have conducted significant changes in operations and supply chain management (SCM) processes. Swift changes in manufacturing and service systems have led to phenomenal improvements in

productivity. The fast-paced environment brings new challenges and opportunities for the companies that are associated with the adaptation to the new concepts such as Internet of Things (IoT) and Cyber Physical Systems, artificial intelligence (AI), robotics, cyber security, data analytics, block chain and cloud technology. These emerging technologies facilitated and expedited the birth of Logistics 4.0. Industrial Revolution 4.0 initiatives in SCM has attracted stakeholders' attentions due to its ability to empower using a set of technologies together that helps to execute more efficient production and distribution systems. This initiative has been called Logistics 4.0 of the fourth Industrial Revolution in SCM due to its high potential. Connecting entities, machines, physical items and enterprise resources to each other by using sensors, devices and the internet along the supply chains are the main attributes of Logistics 4.0. IoT enables customers to make more suitable and valuable decisions due to the data-driven structure of the Industry 4.0 paradigm. Besides that, the system's ability of gathering and analyzing information about the environment at any given time and adapting itself to the rapid changes add significant value to the SCM processes. In this peer-reviewed book, experts from all over the world, in the field present a conceptual framework for Logistics 4.0 and provide examples for usage of Industry 4.0 tools in SCM. This book is a work that will be beneficial for both practitioners and students and academicians, as it covers the theoretical framework, on the one hand, and includes examples of practice and real world.

Since 1994, the European Conferences of Product and Process Modelling (www.ecppm.org) have provided a review of research, development and industrial implementation of product and process model technology in the Architecture, Engineering, Construction and Facilities Management (AEC/FM) industry. Product/Building Information Modelling has matured significantly in the last few years and has never been closer to having a permanent impact on the AEC/FM industry as a mainstream technology. In this context the 9th European Conference of Product and Process Modelling provided a forum for leading experts to discuss the latest achievements, emerging trends and future directions in product and process modelling technology in this dynamic and fragmented industry, focusing on integrated project working, value-based life cycle management and intelligent and sustainable buildings and construction. eWork and eBusiness in Architecture, Engineering and Construction 2012 provides a comprehensive overview of topics including BIM in all life-cycle stages, ICT for energy efficiency, smart buildings and environmental performance, energy and building simulation, knowledge and semantic modelling, visualization technologies as well as tools and methods to support innovations in design and construction processes. It further includes the proceedings of the 3rd Workshop on eeBuildings Data Models (Energy Efficiency Vocabularies), which aim to identify ICT Energy Efficiency Vocabularies and Ontologies to foster interoperability of Energy Efficiency Management Systems. eWork and eBusiness in Architecture, Engineering and Construction 2012 will be of interest to academics and professionals working in the interdisciplinary area of information technology in architecture, engineering and construction.

Smart manufacturing uses big data, the Internet of things (IoT) and the Internet of Services (IoS), and flexible and dynamic workforces to cope with ever-increasing demand in low-volume, high-mix production. Companies worldwide are already pivoting towards dynamic and reconfigurable production as a smarter way to build and make things. As such, this book discusses the next generation of manufacturing, which will involve the transformational convergence of intelligent machines, powerful computing and analytics, and unprecedented networking of people, products, and services.

Featuring contributions from major technology vendors, industry consortia, and government and private research establishments, the Industrial Communication Technology Handbook, Second Edition provides comprehensive and authoritative coverage of wire- and wireless-based specialized communication networks used in plant and factory automation, automotive applications, avionics, building automation, energy and power systems, train applications, and more. New to the Second Edition: 46 brand-new chapters and 21 substantially revised chapters Inclusion of the latest, most significant developments in specialized communication technologies and systems Addition of new application domains for specialized networks The Industrial Communication Technology Handbook, Second Edition supplies readers with a thorough understanding of the application-specific requirements for communication services and their supporting technologies. It is useful to a broad spectrum of professionals involved in the conception, design, development, standardization, and use of specialized communication networks as well as academic institutions engaged in engineering education and vocational training.

Este libro desarrolla los contenidos del módulo profesional de Instalaciones Domóticas que siguen los alumnos del Ciclo Formativo de grado medio de Instalaciones Eléctricas y Automáticas. Alberga abundante material gráfico que complementa y enriquece sus explicaciones teóricas. La extensa colección de casos prácticos y actividades propuestas permiten al alumno poner en práctica los conceptos aprendidos. Como elemento de apoyo, el libro incorpora un CD-ROM en el que se incluye una colección de materiales complementarios: videos, catálogos, bases de datos para ETS, normativa y software de simulación.

This book addresses the emerging trend of smart grids in power systems. It discusses the advent of smart grids and selected technical implications; further, by combining the perspectives of researchers from Europe and South America, the book captures the status quo of and approaches to smart grids in a wide range of countries. It describes the basic concepts, enabling readers to understand the theoretical aspects behind smart grid formation, while also examining current challenges and philosophical discussions. Like the industrial revolution and the birth of the Internet, smart grids are certain to change the way people use electricity. In this regard, a new term – the “prosumer” – is used to describe consumers who may sometimes also be energy producers. This is particularly appealing if we bear in mind that most of the distributed power generation in smart grids does not involve carbon emissions. At first glance, the option of generating their own power could move consumers to leave their current energy provider. Yet the authors argue that doing so is not a wise choice: utilities will play a central role in this new scenario and should not be ignored.

This book addresses conference topics such as information technology in the design and manufacture of engines;

information technology in the creation of rocket space systems; aerospace engineering; transport systems and logistics; big data and data science; nano-modeling; artificial intelligence and smart systems; networks and communication; cyber-physical systems and IoE; and software engineering and IT infrastructure. The International Scientific and Technical Conference "Integrated Computer Technologies in Mechanical Engineering" - Synergetic Engineering (ICTM) was formed to bring together outstanding researchers and practitioners in the field of information technology, and whose work involves the design and manufacture of engines, creation of rocket space systems, and aerospace engineering, from all over the world to share their experiences and expertise. It was established by the National Aerospace University "Kharkiv Aviation Institute." The ICTM'2020 conference was held in Kharkiv, Ukraine on October 28-30, 2020. .

Modern buildings are increasingly equipped with actuators and sensors, communication, visualization and control systems. This textbook provides an overview of industrial communication systems and stimulates a basic understanding of network and bus systems for the automation of buildings. After an introduction to EIB/KNX, LON und BACnet technologies, the authors illustrate how these systems can be utilized for specific applications, like air conditioning or illumination. This book assumes only a basic knowledge of mathematics and thanks to its simple explanations and many examples is ideal for students and professional engineers who require practical solutions.

The capability and use of IT and web based energy information and control systems has expanded from single facilities to multiple facilities and organizations with buildings located throughout the world. This book answers the question of how to take the mass of available data and extract from it simple and useful information which can determine what actions to take to improve efficiency and productivity of commercial, institutional and industrial facilities. The book also provides insight into the areas of advanced applications for web based EIS and ECS systems, and the integration of IT/web based information and control systems with existing BAS systems.

This book constitutes the proceedings of the 17th International System Design Language Forum, SDL 2015, held in Berlin, Germany, in October 2015. The 15 full papers and 4 short papers presented in this volume were carefully reviewed and selected from 26 submissions. They are organized in topical sections named: smart cities and distributed systems; specification and description language; domain specific languages; goal modeling; use-case modeling; and model-based testing.

This book examines seven key combinatorial engineering frameworks (composite schemes consisting of algorithms and/or interactive procedures) for hierarchical modular (composite) systems. These frameworks are based on combinatorial optimization problems (e.g., knapsack problem, multiple choice problem, assignment problem, morphological clique problem), with the author's version of morphological design approach – Hierarchical Morphological Multicriteria Design (HMMD) – providing a conceptual lens with which to elucidate the examples discussed. This approach is based on ordinal estimates of design alternatives for systems parts/components, however, the book also puts forward an original version of HMMD that is based on new interval multiset estimates for the design alternatives with special attention paid to the aggregation of modular solutions (system versions). The second part of 'Modular System Design and Evaluation' provides ten information technology case studies that enriches understanding of the design of system design, detection of system bottlenecks and system improvement, amongst others. The book is intended for researchers and scientists, students, and practitioners in many domains of information technology and engineering. The book is also designed to be used as a text for courses in system design, systems engineering and life cycle engineering at the level of undergraduate level, graduate/PhD levels, and for continuing education. The material and methods contained in this book were used over four years in Moscow Institute of Physics and Technology (State University) in the author's faculty course "System Design".

This textbook presents an end-to-end Internet of Things (IoT) architecture that comprises of devices, network, compute, storage, platform, applications along with management and security components with focus on the missing functionality in the current state of the art. As with the first edition, it is organized into six main parts: an IoT reference model; Fog computing and the drivers; IoT management and applications ranging from smart homes to manufacturing and energy conservation solutions; Smart Services in IoT; IoT standards; and case studies. The textbook edition features a new chapter entitled The Blockchain in IoT, updates based on latest standards and technologies, and new slide ware for professors. It features a full suite of classroom material for easy adoption.

Smart Buildings is a practical guide and resource for architects, engineers, facility managers, developers, contractors, and design consultants. The book covers the costs and benefits of smart buildings, and the basic design foundations, technology systems, and management systems encompassed within a smart building. Unlike other resources, Smart Buildings is organized to provide an overview of each of the technology systems in a building, and to indicate where each of these systems is in their migration to and utilization of the standard underpinnings of a smart building.

This book is a marvellous thing: an important intervention in the policy debate about information security and a practical text for people trying to improve the situation. — Cory Doctorow author, co-editor of Boing Boing A future with billions of connected "things" includes monumental security concerns. This practical book explores how malicious attackers can abuse popular IoT-based devices, including wireless LED lightbulbs, electronic door locks, baby monitors, smart TVs, and connected cars. If you're part of a team creating applications for Internet-connected devices, this guide will help you explore security solutions. You'll not only learn how to uncover vulnerabilities in existing IoT devices, but also gain deeper insight into an attacker's tactics. Analyze the design, architecture, and security issues of wireless lighting systems Understand how to breach electronic door locks and their wireless mechanisms Examine security design flaws in remote-controlled baby monitors Evaluate the security design of a suite of IoT-connected home products Scrutinize security vulnerabilities in smart TVs Explore research into security weaknesses in smart cars Delve into prototyping techniques that address security in initial designs Learn plausible attacks scenarios based on how people will likely use

IoT devices

This book aims to provide a broad overview of various topics of Internet of Things (IoT), ranging from research, innovation and development priorities to enabling technologies, nanoelectronics, cyber-physical systems, architecture, interoperability and industrial applications. All this is happening in a global context, building towards intelligent, interconnected decision making as an essential driver for new growth and co-competition across a wider set of markets. It is intended to be a standalone book in a series that covers the Internet of Things activities of the IERC – Internet of Things European Research Cluster from research to technological innovation, validation and deployment. The book builds on the ideas put forward by the European Research Cluster on the Internet of Things Strategic Research and Innovation Agenda, and presents global views and state of the art results on the challenges facing the research, innovation, development and deployment of IoT in future years. The concept of IoT could disrupt consumer and industrial product markets generating new revenues and serving as a growth driver for semiconductor, networking equipment, and service provider end-markets globally. This will create new application and product end-markets, change the value chain of companies that creates the IoT technology and deploy it in various end sectors, while impacting the business models of semiconductor, software, device, communication and service provider stakeholders. The proliferation of intelligent devices at the edge of the network with the introduction of embedded software and app-driven hardware into manufactured devices, and the ability, through embedded software/hardware developments, to monetize those device functions and features by offering novel solutions, could generate completely new types of revenue streams. Intelligent and IoT devices leverage software, software licensing, entitlement management, and Internet connectivity in ways that address many of the societal challenges that we will face in the next decade.

This holistic book is an invaluable reference for addressing various practical challenges in architecting and engineering Intelligent IoT and eHealth solutions for industry practitioners, academic and researchers, as well as for engineers involved in product development. The first part provides a comprehensive guide to fundamentals, applications, challenges, technical and economic benefits, and promises of the Internet of Things using examples of real-world applications. It also addresses all important aspects of designing and engineering cutting-edge IoT solutions using a cross-layer approach from device to fog, and cloud covering standards, protocols, design principles, reference architectures, as well as all the underlying technologies, pillars, and components such as embedded systems, network, cloud computing, data storage, data processing, big data analytics, machine learning, distributed ledger technologies, and security. In addition, it discusses the effects of Intelligent IoT, which are reflected in new business models and digital transformation. The second part provides an insightful guide to the design and deployment of IoT solutions for smart healthcare as one of the most important applications of IoT. Therefore, the second part targets smart healthcare-wearable sensors, body area sensors, advanced pervasive healthcare systems, and big data analytics that are aimed at providing connected health interventions to individuals for healthier lifestyles.

A complete handbook for Modbus field technicians and the beginners. This guide takes a practical approach to Modbus, discussing issues that affect installation, design and trouble shooting. Emphasis is on Modbus RS232, RS485 and TCP/IP. Additional articles and useful resources are available at www.chipkin.com

Interfacing PIC Microcontrollers, 2nd Edition is a great introductory text for those starting out in this field and as a source reference for more experienced engineers. Martin Bates has drawn upon 20 years of experience of teaching microprocessor systems to produce a book containing an excellent balance of theory and practice with numerous working examples throughout. It provides comprehensive coverage of basic microcontroller system interfacing using the latest interactive software, Proteus VSM, which allows real-time simulation of microcontroller based designs and supports the development of new applications from initial concept to final testing and deployment.

Comprehensive introduction to interfacing 8-bit PIC microcontrollers Designs updated for current software versions MPLAB v8 & Proteus VSM v8 Additional applications in wireless communications, intelligent sensors and more

This book includes a selection of articles from The 2018 Multidisciplinary International Conference of Research Applied to Defense and Security (MICRADS'18), held in Salinas, Peninsula de Santa Elena, Ecuador, from April 18 to 20, 2018. MICRADS is an international forum for researchers and practitioners to present and discuss the most recent innovations, trends, results, experiences and concerns in the various areas of defense and security, together with their technological development and applications. The main topics covered are: Information and Communication Technology in Education; Computer Vision in Military Applications; Engineering Analysis and Signal Processing; Cybersecurity and Cyberdefense; Maritime Security and Safety; Strategy, Geopolitics and Oceanopolitics; Defense planning; Leadership (e-leadership); Defense Economics; Defense Logistics; Health Informatics in Military Applications; Simulation in Military Applications; Computer Networks, Mobility and Pervasive Systems; Military Marketing; Military Physical Training; Assistive Devices and Wearable Technology; Naval and Military Engineering; Weapons and Combat Systems; Operational Oceanography. The book is aimed at all those dealing with defense and security issues, including practitioners, researchers and teachers as well as undergraduate, graduate, master's and doctorate students. This book gathers selected papers presented at the 4th International Conference on Artificial Intelligence and Evolutionary Computations in Engineering Systems, held at the SRM Institute of Science and Technology, Kattankulathur, Chennai, India, from 11 to 13 April 2019. It covers advances and recent developments in various computational intelligence techniques, with an emphasis on the design of communication systems. In addition, it shares valuable insights into advanced computational methodologies such as neural networks, fuzzy systems, evolutionary algorithms, hybrid intelligent systems, uncertain reasoning techniques, and other machine learning methods and their application to decision-making and problem-solving in mobile and wireless communication networks.

With the growth of renewable energy sources, microgrids have become a key component in the distribution of power to localized areas while connected to the traditional grid or operating in a disconnected island mode. Based on the extensive real-world experience of the authors, this cutting-edge resource provides a basis for the design, installation, and day-by-day management of microgrids. Professionals find coverage of the critical aspects they need to understand, from the initial planning and the selection of the most appropriate technologies and equipment, to optimal management and real-time control. Moreover, this forward-looking book places emphasis on new architectures of the energy systems of the future. Written in accessible language with practical examples, the book explains advanced topics such as optimization algorithms for energy management systems, control issues for both on-grid and island mode, and microgrid protection. Practitioners are also provided with a complete vision for the deployment of the microgrid in smart cities.

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