Smart Home Energy Management System Based Iosr Journals

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Sensor Technology for Smart Homes
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Complex, Intelligent, and Software Intensive Systems
Communications in Microgrids
Sensor Technology for Smart Homes
Smart Grid Security
Complex, Intelligent,

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Smart Cities—Opportunities and Challenges
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Hybrid Artificial Intelligent Systems
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Proceedings of 2018 Chinese Intelligent Systems Conference
Smart Energy Control Systems for Sustainable Buildings
Smart Power Distribution Systems
Handbook of Research on Smart Power System Operation and Control
Proceedings of International Conference on Recent Trends in Machine Learning, IoT, Smart Cities and Applications
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Introduction to Internet of Things in Management Science and Operations
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Organic Smart Home - Energiemanagement für Intelligente Gebäude
Green City Planning and Practices in Asian Cities

Comprehensive Energy Systems Application of Machine Learning and Deep Learning Methods to Power System Problems
Smart Energy Management for Smart Grids
Proceedings of SAI Intelligent Systems Conference (IntelliSys) 2016
Energy Harvesting and Energy Efficiency
Fog Computing in the Internet of Things

Smart Grid Security
Comprehensive Energy Systems

Wireless and Satellite Systems
Because society depends greatly on electric energy, power system control and protection focuses on ensuring a secure and reliable supply of power. To operate the electric systems in safe mode, the power system component should be equipped with intelligent controllers. The Handbook of Research on Smart Power System Operation and Control is a collection of innovative research on the theoretical and practical developments in smart power system operation and control that takes into account both smart grid and micro-grid systems. While highlighting topics including cybersecurity, smart grid, and wide area monitoring, this book is ideally designed for researchers, students, and industry professionals.

Sensor Technology for Smart Homes

Smart Grid Security
Comprehensive Energy Systems

This book provides a unified source of information covering the entire spectrum of energy, one of the most significant issues humanity has to face. This comprehensive book describes traditional and novel energy systems, from single generation to multi-generation, also covering theory and applications. In addition, it also presents high-level coverage on energy policies, strategies, environmental impacts and sustainable development. No other published work covers such breadth of topics in similar depth. High-level sections include Energy Fundamentals, Energy Materials, Energy Production, Energy Conversion, and Energy Management. Offers the most comprehensive resource available on the topic of energy systems Presents an authoritative resource authored and edited by leading experts in the field Consolidates information currently scattered in publications from different research fields (engineering as well as physics, chemistry, environmental sciences and economics), thus ensuring a common standard and language.

Complex, Intelligent, and Software Intensive Systems

Smart grid and microgrid technology are growing exponentially as they are adopted throughout the world. These new technologies have revolutionized the way electricity is produced, delivered, and consumed, and offer a plethora of benefits as well as the potential for further growth. It is critical to examine the current stage of smart grid and microgrid development as well as the direction they are headed as they continue to expand in order to ensure that cost-effective, reliable, and efficient systems are put in place. The Research Anthology on Smart Grid and Microgrid Development is an all-encompassing reference source of the latest innovations and trends within smart grid and microgrid development. Detailing benefits, challenges, and opportunities, it is a crucial resource to fully understand the current opportunities that smart grids and microgrids present around the world. Covering a wide range of topics such as traditional grids, future smart grids, electrical distribution systems, and microgrid integration, it is ideal for engineers, policymakers, systems developers, technologists, researchers, government officials, academicians, environmental groups, regulators, utilities specialists, industry professionals, and students.

Communications in Microgrids

This book provides a thorough guide to the use of numerical methods in energy systems and applications. It presents methods for analysing engineering applications for energy systems, discussing finite difference, finite element, and other advanced numerical methods. Solutions to technical problems on Smart Grid and Microgrid Development Internet are thoroughly explored. Readers will discover diverse perspectives of the contributing authors and extensive discussions of issues including: a wide variety of numerical methods concepts and related energy systems applications; systems equations and optimization, partial differential equations, and finite difference method; methods for solving nonlinear equations, special methods, and their mathematical implementation in multi-energy sources; numerical investigations of electrochemical fields and devices; and issues related to numerical approaches and optimal integration of energy consumption. This is a highly informative and carefully presented book, providing scientific and academic insight for readers with an interest in numerical methods and energy systems.

Interaktives Gebaeude-Energiemanagement

These proceedings of the SAI Intelligent Systems Conference 2016
(IntelliSys 2016) offer a remarkable collection of papers on a wide range of topics in intelligent systems, and their applications to the real world. Authors hailing from 56 countries on 5 continents submitted 404 papers to the conference, attesting to the global importance of the conference’s themes. After being reviewed, 222 papers were accepted for presentation, and 168 were ultimately selected for these proceedings. Each has been reviewed on the basis of its originality, novelty and rigorousness. The papers not only present state-of-the-art methods and valuable experience from researchers in the related research areas; they also outline the field’s future development.

Smart Cities—Opportunities and Challenges Design, Analysis and Applications of Renewable Energy Systems covers recent advancements in the study of renewable energy control systems by bringing together diverse scientific breakthroughs on the modeling, control and optimization of renewable energy systems as conveyed by leading energy systems engineering researchers. The book focuses on present novel solutions for many problems in the field, covering modeling, control theorems and the optimization techniques that will help solve many scientific issues for researchers. Multidisciplinary applications are also discussed, along with their fundamentals, modeling, analysis, design, realization and experimental results. This book fills the gaps between different interdisciplinary applications, ranging from mathematical concepts, modeling, and analysis, up to the realization and experimental work. Presents some of the latest innovative approaches to renewable energy systems from the point-of-view of dynamic modeling, system analysis, optimization, control and circuit design. Focuses on advances related to optimization techniques for renewable energy and forecasting using machine learning methods. Includes new circuits and systems, helping researchers solve many nonlinear problems.

Energy Management Systems

Research Anthology on Smart Grid and Microgrid Development ACTIVE ELECTRICAL DISTRIBUTION NETWORK Discover the major issues, solutions, techniques, and applications of active electrical distribution networks with this edited resource Active Electrical Distribution Network: A Smart Approach delivers a comprehensive and insightful guide dedicated to addressing the major issues affecting an often-overlooked sector of the electrical industry: electrical distribution. The book discusses in detail a variety of challenges facing the smart electrical distribution network and presents a detailed framework to address these challenges with renewable energy integration. The book offers readers fulsome analyses of active distribution networks for smart grids, as well as active control approaches for distributed generation, electric vehicle technology, smart metering systems, smart monitoring devices, smart management systems, and various storage systems. It provides a treatment of the analysis, modeling, and implementation of active electrical distribution systems and an exploration of the ways professionals and researchers from academia and industry attempt to meet the significant challenges facing them. From smart home energy management systems to approaches for the reconfiguration of active distribution networks with renewable energy integration, readers will also enjoy: A thorough introduction to electrical distribution networks, including conventional and smart networks An exploration of various existing issues related to the electrical distribution network An examination of the importance of harmonics mitigation in smart distribution networks, including active filters A treatment of reactive power compensation under smart distribution networks, including techniques like capacitor banks and smart devices An analysis of smart distribution network reliability assessment and enhancement Perfect for professionals, scientists, technologists, developers, designers, and researchers in smart grid technologies, security, and information technology, Active Electrical Distribution Network: A Smart Approach will also earn a place in the libraries of policy and administration professionals, as well as those involved with electric utilities, electric policy development, and regulating authorities.

Internet of Things, for Things, and by Things The Special Issue Distributed Energy Resources Management 2018 includes 13 papers, and is a continuation of the Special Issue Distributed Energy Resources Management. The success of the previous edition shows the unquestionable relevance of distributed energy resources in the operation of power and energy systems at both the distribution level and at the wider power system level. Improving the management of distributed energy resources makes it possible to accommodate the higher penetration of intermittent distributed generation and electric vehicle charging. Demand response programs, namely the ones with a distributed nature, allow the consumers to contribute to the increased system efficiency while receiving benefits. This book addresses the management of distributed energy resources, with a focus on methods and techniques to achieve an optimized operation, in order to aggregate the resources namely in the scope of virtual power players and other types of aggregators, and to remunerate them. The integration of distributed resources in electricity markets is also addressed as an enabler for their increased and efficient use.

Guide to Computing Fundamentals in Cyber-Physical Systems

Distributed Energy Resources Management 2018 This book comprises of 13 chapters and is written by experts from industries, and academics from countries such as USA, Canada, Germany, India, Australia, Spain, Italy, Japan, Slovenia, Malaysia, Mexico, etc. This book covers many important aspects of energy management, forecasting, optimization methods and their applications in selected industrial, residential, generation system. This book also captures important aspects of smart grid and photovoltaic system. Some of the key features of books are as follows: Energy management methodology in industrial plant with a case study; Online energy system optimization modelling; Energy optimization case study; Energy demand analysis and forecast; Energy management in intelligent buildings; PV array energy yield case study of Slovenia; Optimal design of cooling water systems; Supercapacitor design methodology for transportation; Locomotive tractive energy resources management; Smart grid and dynamic power management.

Design, Analysis and Applications of Renewable Energy Systems Smart Power Distribution Systems: Control, Communication, and Optimization explains how diverse technologies work to build and maintain smart grids
around the globe. Yang, Yang and Li present the most recent advances in the control, communication and optimization of smart grids and provide unique insight into power system control, sensing and communication, and optimization technologies. The book covers control challenges for renewable energy and smart grids, communication in smart power systems, and optimization challenges in smart power system operations. Each area discussed focuses on the scientific innovations relating to the approaches, methods and algorithmic solutions presented. Readers will develop sound knowledge and gain insights into the integration of renewable energy generation in smart power distribution systems. Presents the latest technological advances in electric power distribution networks, with a particular focus on methodologies, approaches and algorithms. Provides insights into the most recent research and developments from expert contributors from across the world. Presents a clear and methodical structure that guides the reader through discussion and analysis, providing unique insights and sound knowledge along the way.

Integration of Distributed Energy Resources in Power Systems This Special Issue presents the recent advances in sensor technologies for smart homes, including fiber Bragg grating (FBG) sensors for detecting the presence and number of occupants, the Internet of things for monitoring CO2 concentration, and designing a novel eye-tracking system for monitoring and controlling a smart home, and infrared thermal sensors for fall detection. Such new explorations are pushing the boundary of sensing technologies and, thus, will have more profound implications for the future smart home. Advanced machine learning and data mining algorithms have been proposed to address sensor failure, appliance identification, and human activity recognition in a home environment. These results will enable a promising, sustainable deployment of sensing technologies. A novel multi-agent gamification system is proposed for managing tasks between household members and between families, which demonstrate another dimension of future smart home application. This Special Issue concludes with a review on sensors for human activity recognition. This work paves the roadmap for deploying smart home systems in different socioeconomic contexts. The whole Special Issue has significantly helped to shape our understanding of the strength, implications, and barriers of deploying long-term, sustainable, sensor technologies for smart homes.

Hybrid Artificial Intelligent Systems Energy has been a crucial element for human beings and sustainable development. The issues of global warming and non-green energy have yet to be resolved. This book is a collection of twelve articles that provide strong evidence for the success of artificial intelligence deployment in energy research, particularly research devoted to non-intrusive load monitoring, network, and grid, as well as other emerging topics. The presented artificial intelligence algorithms may provide insight into how to apply similar approaches, subject to fine-tuning and customization, to other unexplored energy research. The ultimate goal is to fully apply artificial intelligence to the energy sector. This book may serve as a guide for professionals, researchers, and data scientists—namely, how to share opinions and exchange ideas so as to facilitate a better fusion of energy, academic, and industry research, and improve in the quality of people’s daily life activities.

Energy Performance and Indoor Climate Analysis in Buildings This book constitutes the thoroughly refereed post-conference proceedings of the Second International Workshop on Smart Grid Security, SmartGridSec 2014, held in Munich, Germany, in February 2014. The volume contains twelve corrected and extended papers presented at the workshop which have undergone two rounds of reviewing and improvement. The engineering, deployment and operation of the future Smart Grid will be an enormous project that will require the active participation of many stakeholders with different interests and views regarding the security and privacy goals, technologies, and solutions. There is an increasing need for workshops that bring together researchers from different communities, from academia and industry, to discuss open research topics in the area of future Smart Grid security.

Advances in Swarm Intelligence This book describes state-of-the-art approaches to Fog Computing, including the background of innovations achieved in recent years. Coverage includes various aspects of fog computing architectures for Internet of Things, driving reasons, variations and case studies. The authors discuss in detail key topics, such as meeting low latency and real-time requirements of applications, interoperability, federation and heterogeneous computing, energy efficiency and mobility, fog and cloud interplay, geo-distribution and location awareness, and case studies in healthcare and smart space applications.

Intelligent Computing Techniques for Smart Energy Systems Urban planners across the world are faced with sustainable development issues in their work, especially when they are tasked with creating green cities or where sustainable and smart growth in urban settings are set as primary goals. This book introduces green city planning and practices from the three dimensions of green-building innovation, community development and smart city strategies, and argues that effective implementation of green city planning are a necessary pre-condition for reaching sustainable urban development. A range of authors representing a broad disciplinary spectrum bring together the different standards of green building methods and urban design techniques and clearly sketch the roles of both spatial designers and urban researchers in the implementation of green city planning at regional, community and single-building level in order to arrive at an integrated approach across different scales.

Smart Home Energy Management System for Monitoring and Scheduling of Home Appliances

Energy Conservation in Residential, Commercial, and Industrial Facilities There is widespread interest in the way that smart energy control systems, such as assessment and monitoring techniques for low carbon, nearly-zero energy and near-positive buildings can contribute to a sustainable future for current and future generations. There is a turning point on the horizon for the supply of energy from finite resources such as natural gas and oil become less reliable in economic terms and extraction become more challenging, and more unacceptable socially, such as adverse public reaction to ‘fracking’. Thus, in 2016 these challenges are having a major influence on the design, optimisation, performance measurements, operation and preservation of:
buildings, neighbourhoods, cities, regions, countries and continents. The source and nature of energy, the security of supply and the equity of distribution, the environmental impact of its supply and utilization, are all crucial matters to be addressed by suppliers, consumers, governments, industry, academia, and financial institutions. This book entitled ‘Smart Energy Control Systems for Sustainable Buildings’ contains eleven chapters written by international experts based on enhanced conference papers presented at the Sustainability and Energy in Buildings International conference series. This book will be of interest to University staff and students; and also industry practitioners.

Proceedings of 2018 Chinese Intelligent Systems Conference This book and its companion volume, LNCS vol. 8794 and 8795 constitute the proceedings of the 5th International Conference on Swarm Intelligence, ICSI 2014, held in Hefei, China in October 2014. The 107 revised full papers presented were carefully reviewed and selected from 198 submissions. The papers are organized in 18 cohesive sections, 3 special sessions and one competitive session covering all major topics of swarm intelligence research and development such as novel swarm-based search methods; novel optimization algorithm; particle swarm optimization; ant colony optimization for travelling salesman problem; artificial bee colony algorithms; artificial immune system; evolutionary algorithms; neural networks and fuzzy methods; hybrid methods; multi-objective optimization; multi-agent systems; evolutionary clustering algorithms; classification methods; GPU-based methods; scheduling and path planning; wireless sensor networks; power system optimization; smart intelligence in image and video processing; applications of swarm intelligence to management problems; smart intelligence for real-world application.

Smart Energy Control Systems for Sustainable Buildings This book gathers selected research papers presented at the International Conference on Recent Trends in Machine Learning, IOT, Smart Cities & Applications (ICMISC 2020), held on 29-30 March 2020 at CMR Institute of Technology, Hyderabad, Telangana, India. Discussing current trends in machine learning, Internet of things, and smart cities applications, with a focus on multi-disciplinary research in the area of artificial intelligence and cyber-physical systems, this book is a valuable resource for scientists, research scholars and PG students wanting formulate their research ideas and find the future directions in these areas. Further, it serves as a reference work anyone wishing to understand the latest technologies used by practicing engineers around the globe.

Smart Power Distribution Systems These proceedings present selected research papers from CISC’18, held in Wenzhou, China. The topics include Multi-Agent Systems, Networked Control Systems, Intelligent Robots, Complex System Theory and Swarm Behavior, Event-Triggered Control and Data-Driven Control, Robust and Adaptive Control, Big Data and Brain Science, Process Control, Nonlinear and Variable Structure Control, Intelligent Sensor and Detection Technology, Deep learning and Learning Control Guidance, Navigation and Control of Flight Vehicles, and so on. Engineers and researchers from academia, industry, and government can get an insight view of the solutions combining ideas from multiple disciplines in the field of intelligent systems.

Handbook of Research on Smart Power System Operation and Control This book constitutes the proceedings of the 7th International Conference on Wireless and Satellite Services, WiSATS 2015, held in Bradford, UK, in July 2015. The conference was formerly known as the International Conference on Personal Satellite Services (PSATS) mainly covering topics in the satellite domain. As the scope of the conference widened to include wireless systems, the conference was renamed to WiSATS. The 29 revised papers were presented at the conference in three technical sessions and one special session on “Network Coding for Satellites”. WiSATS 2015 also hosted two workshops along with the main conference: The first workshop, Communication Applications in Smart Grid (CASG 2015), focused on the merging area of using communication technology within the electricity power grid for smart monitoring and control. The second workshop, Advanced Next-Generation Broadband Satellite Systems (BSS 2015), focused on the use of satellite systems for providing next-generation broadband services.

Proceedings of International Conference on Recent Trends in Machine Learning, IoT, Smart Cities and Applications This book explains the concept of data centers, including data collection, public parking systems, smart metering, and sanitizer dispensers. Electric urban transport systems and effective electric distribution in smart cities are discussed as well. The extensive role of power electronics in smart building applications, such as electric vehicles, rooftop terracing, and renewable energy integration, is included. Case studies on automation in smart homes and commercial and official buildings are elaborated. This book describes the complete implication of smart buildings via industrial, commercial, and community platforms. FEATURES Systematically defines energy-efficient buildings employing power consumption optimization techniques with the inclusion of renewable energy sources Covers data centers and cybersecurity with excellent data storage features for smart buildings Includes systematic and detailed strategies for building air-conditioning and lighting Details smart building security propulsion This book is aimed at graduate students, researchers, and professionals in building systems engineering, architectural engineering, and electrical engineering.

Control Applications in Modern Power System This volume constitutes the refereed proceedings of the 13th International Conference on Hybrid Artificial Intelligent Systems, HAIS 2018, held in Oviedo, Spain, in June 2018. The 62 full papers published in this volume were carefully reviewed and selected from 104 submissions. They are organized in the following topical sections: Neurocomputing, fuzzy systems, rough sets, evolutionary algorithms, Agents and Multiagent Systems, and alike.

Introduction to Internet of Things in Management Science and Operations Research This book provides a platform of scientific interaction between the three challenging and closely linked areas of ICT-enabled- application research and development: software intensive systems, complex systems and intelligent systems. Software intensive systems strongly interact with other systems, sensors, actuators, devices, other software systems and users. More and more domains are using software intensive systems, e.g. automotive and...
telecommunication systems, embedded systems in general, industrial automation systems and business applications. Moreover, web services offer a new platform for enabling software intensive systems. Complex systems research is focused on the overall understanding of systems rather than their components. Complex systems are characterized by the changing environments in which they interact. They evolve and adapt through internal and external dynamic interactions. The development of intelligent systems and agents, which are increasingly characterized by their capacity to perform ontological reasoning, offer impulses for both software intensive systems and complex systems. Recent research in the field of intelligent systems, robotics, neuroscience, artificial intelligence, and cognitive sciences are vital for the future development and innovation of software intensive and complex systems.

Design and Implementation of Wireless Smart Home Energy Management System Using Rule-based Controller This book aims to provide relevant theoretical frameworks and the latest empirical research findings in Internet of Things (IoT) in Management Science and Operations Research. It starts with basic concept and presents cases, applications, and solutions. The contributed articles will explain the potential and application of IoT to a wide array of topics as space permits. Examples are from smart industry; city; transportation; home and smart devices. They present future applications, trends, and potential future of this new discipline. Specifically, this book provides an interface between the main disciplines of engineering/technology and the organizational, administrative, and planning capabilities of managing IoT. This book deals with the implementation of latest IoT research findings in practice at the global economy level, at networks and organizations, at teams and work groups and, finally, IoT at the level of players in the networked environments. This book is intended for professionals in the field of engineering, information science, mathematics, economics, and researchers who wish to develop applications in IoT, or who employ the IoT discipline as part of their work. It will improve their understanding of the strategic role of IoT at various levels of the information and knowledge organization. The book is complemented by a second volume of the same editors with practical cases.

Numerical Methods for Energy Applications This book is a contribution from the authors, to share solutions for a better and sustainable power grid. Renewable energy, smart grid security and smart energy management are the main topics discussed in this book.

Smart Buildings Digitalization HVAC systems, load shifting, indoor climate, and energy and ventilation performance analyses are the key topics when improving energy performance in new and renovated buildings. This development has been boosted by the recently established nearly zero energy building requirements that will soon be in use in all EU Member States, as well as similar long-term zero energy building targets in Japan, the US, and other countries. The research covered in this Special Issue provides evidence of how new technical solutions have worked, in practice, in new or renovated buildings, and also discusses problems and how solutions should be further developed. Another focus is on the more detailed calculation methods needed for the correct design and sizing of dedicated systems, and for accurate quantification of energy savings. Occupant behavior and building operation is also examined, in order to avoid common performance gaps between calculated and measured performance. These topics demonstrate the challenge of high performance buildings as, in the end, comfortable buildings with good indoor climate which are easy and cheap to operate and maintain are expected by end customers. Ventilation performance, heating and cooling, sizing, energy predictions and optimization, load shifting, and field studies are some of the key topics in this Special Issue, contributing to the future of high performance buildings with reliable operation.

Active Electrical Distribution Network This book presents basic and advanced concepts for energy harvesting and energy efficiency, as well as related technologies, methods, and their applications. The book provides up-to-date knowledge and discusses the state-of-the-art equipment and methods used for energy harvesting and energy efficiency, combining theory and practical applications. Containing over 200 illustrations and problems and solutions, the book begins with overview chapters on the status quo in this field. Subsequent chapters introduce readers to advanced concepts and methods. In turn, the final part of the book is dedicated to technical strategies, efficient methods and applications in the field of energy efficiency, which also makes it of interest to technicians in industry. The book tackles problems commonly encountered using basic methods of energy harvesting and energy efficiency, and proposes advanced methods to resolve these issues. All the methods proposed have been validated through simulation and experimental results. These “hot topics” will continue to be of interest to scientists and engineers in future decades and will provide challenges to researchers around the globe as issues of climate change and changing energy policies become more pressing. Here, readers will find all the basic and advanced concepts they need. As such, it offers a valuable, comprehensive guide for all students and practicing engineers who wishing to learn about and work in these fields.

Artificial Intelligence for Smart and Sustainable Energy Systems and Applications This book presents select proceedings of the Electric Power and Renewable Energy Conference 2020 (EPREC 2020). This book provides rigorous discussions, case studies, and recent developments in emerging areas of control systems, especially, load frequency control, wide-area monitoring, control & instrumentation, optimization, intelligent control, energy management system, SCADA systems, etc. The contents of this book will be useful to researchers and professionals interested in control theory and its applications to power grids and systems. The book can also be used by policy makers and power engineers involved in power generation and distribution.

Organic Smart Home - Energiemanagement für Intelligente Gebäude This book comprises select proceedings of the International Conference on Smart Cities: Opportunities and Challenges (ICSC 2019). The book contains chapters based on urban planning and design, policies and financial management, environment, telecommunication, smart materials, sustainable development, information technologies, data management and urban sociology reflecting the major themes of the conference. The contents focus on current research towards improved governance and efficient management of infrastructure such as water, energy, transportation and housing for sustainable development, economic growth, and improved quality of life.
especially for developing nations. This book will be useful for academicians, researchers, and policy makers interested in designing, developing, planning, managing, and maintaining smart cities.

Green City Planning and Practices in Asian Cities This book presents an in-depth review of the state of the art of cyber-physical systems (CPS) and their applications. Relevant case studies are also provided, to help the reader to master the interdisciplinary material. Features: includes self-test exercises in each chapter, together with a glossary; offers a variety of teaching support materials at an associated website, including a comprehensive set of slides and lecture videos; presents a brief overview of the study of systems, and embedded computing systems, before defining CPS; introduces the concepts of the Internet of Things, and ubiquitous (or pervasive) computing; reviews the design challenges of CPS, and their impact on systems and software engineering; describes the ideas behind Industry 4.0 and the revolutions in digital manufacturing, including smart and agile manufacturing, as well as cybersecurity in manufacturing; considers the social impact of the changes in skills required by the globalized, digital work environment of the future.

Comprehensive Energy Systems This book evaluates the role of innovative machine learning and deep learning methods in dealing with power system issues, concentrating on recent developments and advances that improve planning, operation, and control of power systems. Cutting-edge case studies from around the world consider prediction, classification, clustering, and fault/event detection in power systems, providing effective and promising solutions for many novel challenges faced by power system operators. Written by leading experts, the book will be an ideal resource for researchers and engineers working in the electrical power engineering and power system planning communities, as well as students in advanced graduate-level courses.

Application of Machine Learning and Deep Learning Methods to Power System Problems This book presents some latest treatments of several specific, but fundamental problems about the data communication and control of smart microgrids. It provides readers some valuable insights into advanced control and communication of microgrids. With the help of mathematical tools, graduate students will benefit with a deep understanding of microgrids and explore some new research directions. In the meantime, this book gives various pictures and flowcharts to show how to address some challenges in microgrids. In addition, it provides solutions to several specific technical problems, which might be helpful as references for the R&D staff about power systems in utilities and industry. Specifically, the book introduces the applications of advanced control methods such as sliding mode control and model predictive control for microgrids. After getting in-depth understanding of these advanced control methods, the readers are able to design their own improved controllers for not only microgrids, but also for other real-world power plants. Besides, the readers will also learn how to design distributed transaction mechanisms for power market based on the cutting edge blockchain technology.

Smart Energy Management for Smart Grids The book compiles the research works related to smart solutions concept in context to smart energy systems, maintaining electrical grid discipline and resiliency, computational collective intelligence consisted of interaction between smart devices, smart environments and smart interactions, as well as information technology support for such areas. It includes high-quality papers presented in the International Conference on Intelligent Computing Techniques for Smart Energy Systems organized by Manipal University Jaipur. This book will motivate scholars to work in these areas. The book also prophesies their approach to be used for the business and the humanitarian technology development as research proposal to various government organizations for funding approval.

Proceedings of SAI Intelligent Systems Conference (IntelliSys) 2016 This book explains IoT technology, its potential applications, the security and privacy aspects, the key necessities like governance, risk management, regulatory compliance needs, the philosophical aspects of this technology that are necessary to support an ethical, safe and secure digitally enhanced environment in which people can live smarter. It describes the inherent technology of IoT, the architectural components and the philosophy behind this emerging technology. Then it shows the various potential applications of the Internet of Things that can bring benefits to the human society. Finally, it discusses various necessities to provide a secured and trustworthy IoT service.

Energy Harvesting and Energy Efficiency Integration of Distributed Energy Resources in Power Systems: Implementation, Operation and Control covers the operation of power transmission and distribution systems and their growing difficulty as the share of renewable energy sources in the world’s energy mix grows and the proliferation trend of small scale power generation becomes a reality. The book gives students at the graduate level, as well as researchers and power engineering professionals, an understanding of the key issues necessary for the development of such strategies. It explores the most relevant topics, with a special focus on transmission and distribution areas. Subjects such as voltage control, AC and DC microgrids, and power electronics are explored in detail for all sources, while not neglecting the specific challenges posed by the most used variable renewable energy sources. Presents the most relevant aspects of the integration of distributed energy into power systems, with special focus on the challenges for transmission and distribution. Explores the state-of-the-art in applications of the most current technology, giving readers a clear roadmap. Deals with the technical and economic features of distributed energy resources and discusses their business models.

Fog Computing in the Internet of Things An authoritative and comprehensive guide to managing energy conservation in infrastructures Energy Conservation in Residential, Commercial, and Industrial Facilities offers an essential guide to the business models and engineering design frameworks for the implementation of energy conservation in infrastructures. The presented models of both physical and technological systems can be applied to a wide range of structures such as homes, hotels, public facilities, industrial facilities, transportation, and water/energy supply systems. The authors—note experts in the field—explore the key...
performance indicators that are used to evaluate energy conservation strategies and the energy supply scenarios as part of the design and operation of energy systems in infrastructures. The text is based on a systems approach that demonstrates the effective management of building energy knowledge and supports the simulation, evaluation, and optimization of several building energy conservation scenarios. In addition, the authors explore new methods of developing energy semantic network (ESN) superstructures, energy conservation optimization techniques, and risk-based life cycle assessments. This important text: Defines the most effective ways to model the infrastructure of physical and technological systems Includes information on the most widely used techniques in the validation and calibration of building energy simulation Offers a discussion of the sources, quantification, and reduction of uncertainty Presents a number of efficient energy conservation strategies in infrastructure systems, including HVAC, lighting, appliances, transportation, and industrial facilities Describes illustrative case studies to demonstrate the proposed energy conservation framework, practices, methods, engineering designs, control, and technologies Written for students studying energy conservation as well as engineers designing the next generation of buildings, Energy Conservation in Residential, Commercial, and Industrial Facilities offers a wide-ranging guide to the effective management of energy conservation in infrastructures.