

Smart Lighting Solutions For Smart Cities

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Holistic Approach for Decision Making Towards Designing Smart Cities - George Cristian Lazaroiu 2021-12-17

This edited volume examines strategies to make future cities more sustainable. The aim of these and other initiatives of the recent past, is to transform our cities into smarter cities. Thereby, these solutions are determined to boost clean electricity and pollution reduction, improve the life of citizens and transform city environment and regulatory structures. As the EUs ambition is to become carbon-neutral until 2050, the outlined projects also consider fostering economy prosperity and social wellness and environmental sustainability. The greatest challenge being already built urban spaces that need to be transformed quickly and at low costs. The book will analyze future smart cities in three centric dimensions: energy and sustainable development, smart infrastructures for smart cities, social involvement and economic prosperity. With its global approach, the volume is highly useful for professionals involved in city planning and urban ecology.

Security and Organization within IoT and Smart Cities - Kayhan Zrar Ghafoor 2020-12-30

This book aims to provide the latest research developments and results in the domain of AI techniques for smart cyber ecosystems. It presents a holistic insight into AI-enabled theoretic approaches and methodology in

IoT networking, security analytics using AI tools and network automation, which ultimately enable intelligent cyber space. This book will be a valuable resource for students, researchers, engineers and policy makers working in various areas related to cybersecurity and privacy for Smart Cities. This book includes chapters titled "An Overview of the Artificial Intelligence Evolution and Its Fundamental Concepts, and Their Relationship with IoT Security", "Smart City: Evolution and Fundamental Concepts", "Advances in AI-Based Security for Internet of Things in Wireless Virtualization Environment", "A Conceptual Model for Optimal Resource Sharing of Networked Microgrids Focusing Uncertainty: Paving Path to Eco-friendly Smart Cities", "A Novel Framework for a Cyber Secure Smart City", "Contemplating Security Challenges and Threats for Smart Cities", "Self-Monitoring Obfuscated IoT Network", "Introduction to Side Channel Attacks and Investigation of Power Analysis and Fault Injection Attack Techniques", "Collaborative Digital Forensic Investigations Model for Law Enforcement: Oman as a Case Study", "Understanding Security Requirements and Challenges in the Industrial Internet of Things: A Review", "5G Security and the Internet of Things", "The Problem of Deepfake Videos and How to Counteract Them in Smart Cities", "The Rise of Ransomware Aided by Vulnerable IoT Devices", "Security Issues in Self-Driving Cars within

Smart Cities", and "Trust-Aware Crowd Associated Network-Based Approach for Optimal Waste Management in Smart Cities". This book provides state-of-the-art research results and discusses current issues, challenges, solutions and recent trends related to security and organization within IoT and Smart Cities. We expect this book to be of significant importance not only to researchers and practitioners in academia, government agencies and industries, but also for policy makers and system managers. We anticipate this book to be a valuable resource for all those working in this new and exciting area, and a "must have" for all university libraries.

Emerging Technologies and Applications for a Smart and Sustainable World

- Akhil Jabbar Meerja 2022-09-12

This reference distills information about emerging technologies and applications for smart city design and sustainable urban planning. Chapters present technology use-cases that have radical novelty and high scalability with a prominent impact on community living standards. These technologies prepare urban and rural dwellings for the transformation to the smart world. Applications and techniques highlighted in the book use a combination of artificial intelligence and IoT technologies in areas like transportation, energy, healthcare, education, governance, and manufacturing, to name a few. The book serves as a learning resource for smart city design and sustainable infrastructure planning. Scholars and professionals who are interested in understanding ways for transforming communities into smart communities can also benefit from the cases presented in the book.

Internet of Things: A Hands-On Approach

- Arshdeep Bahga 2014-08-09

Internet of Things (IoT) refers to physical and virtual objects that have unique identities and are connected to the internet to facilitate intelligent applications that make energy, logistics, industrial control, retail, agriculture and many other domains "smarter". Internet of Things is a new revolution of the Internet that is rapidly gathering momentum driven by the advancements in sensor networks, mobile devices, wireless communications, networking and cloud technologies. Experts forecast

that by the year 2020 there will be a total of 50 billion devices/things connected to the internet. This book is written as a textbook on Internet of Things for educational programs at colleges and universities, and also for IoT vendors and service providers who may be interested in offering a broader perspective of Internet of Things to accompany their own customer and developer training programs. The typical reader is expected to have completed a couple of courses in programming using traditional high-level languages at the college-level, and is either a senior or a beginning graduate student in one of the science, technology, engineering or mathematics (STEM) fields. Like our companion book on Cloud Computing, we have tried to write a comprehensive book that transfers knowledge through an immersive "hands on" approach, where the reader is provided the necessary guidance and knowledge to develop working code for real-world IoT applications. Additional support is available at the book's website: www.internet-of-things-book.com

Organization The book is organized into 3 main parts, comprising of a total of 11 chapters. Part I covers the building blocks of Internet of Things (IoTs) and their characteristics. A taxonomy of IoT systems is proposed comprising of various IoT levels with increasing levels of complexity. Domain specific Internet of Things and their real-world applications are described. A generic design methodology for IoT is proposed. An IoT system management approach using NETCONF-YANG is described. Part II introduces the reader to the programming aspects of Internet of Things with a view towards rapid prototyping of complex IoT applications. We chose Python as the primary programming language for this book, and an introduction to Python is also included within the text to bring readers to a common level of expertise. We describe packages, frameworks and cloud services including the WAMP-AutoBahn, Xively cloud and Amazon Web Services which can be used for developing IoT systems. We chose the Raspberry Pi device for the examples in this book. Reference architectures for different levels of IoT applications are examined in detail. Case studies with complete source code for various IoT domains including home automation, smart environment, smart cities, logistics, retail, smart energy, smart agriculture, industrial control

and smart health, are described. Part III introduces the reader to advanced topics on IoT including IoT data analytics and Tools for IoT. Case studies on collecting and analyzing data generated by Internet of Things in the cloud are described.

Smart Cities - Houbing Song 2017-07-12

Provides the foundations and principles needed for addressing the various challenges of developing smart cities Smart cities are emerging as a priority for research and development across the world. They open up significant opportunities in several areas, such as economic growth, health, wellness, energy efficiency, and transportation, to promote the sustainable development of cities. This book provides the basics of smart cities, and it examines the possible future trends of this technology. Smart Cities: Foundations, Principles, and Applications provides a systems science perspective in presenting the foundations and principles that span multiple disciplines for the development of smart cities. Divided into three parts—foundations, principles, and applications—Smart Cities addresses the various challenges and opportunities of creating smart cities and all that they have to offer. It also covers smart city theory modeling and simulation, and examines case studies of existing smart cities from all around the world. In addition, the book: Addresses how to develop a smart city and how to present the state of the art and practice of them all over the world Focuses on the foundations and principles needed for advancing the science, engineering, and technology of smart cities—including system design, system verification, real-time control and adaptation, Internet of Things, and test beds Covers applications of smart cities as they relate to smart transportation/connected vehicle (CV) and Intelligent Transportation Systems (ITS) for improved mobility, safety, and environmental protection Smart Cities: Foundations, Principles, and Applications is a welcome reference for the many researchers and professionals working on the development of smart cities and smart city-related industries.

Smart Cities—Opportunities and Challenges - Sirajuddin Ahmed 2020-04-20

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, energy, transportation, 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.

Smart Cities For Dummies - Reichental 2020-07-15

Become empowered to build and maintain smarter cities At its core, a smart city is a collection of technological responses to the growing demands, challenges, and complexities of improving the quality of life for billions of people now living in urban centers across the world. The movement to create smarter cities is still in its infancy, but ambitious and creative projects in all types of cities—big and small—around the globe are beginning to make a big difference. New ideas, powered by technology, are positively changing how we move humans and products from one place to another; create and distribute energy; manage waste; combat the climate crisis; build more energy efficient buildings; and improve basic city services through digitalization and the smart use of data. Inside this book you'll find out: What it really means to create smarter cities How our urban environments are being transformed Big ideas for improving the quality of life for communities Guidance on how to create a smart city strategy The essential role of data in building better cities The major new technologies ready to make a difference in every community Smart Cities For Dummies will give you the knowledge to understand this important topic in depth and be ready to be an agent of change in your community.

[Solving Urban Infrastructure Problems Using Smart City Technologies](#) -

John R. Vacca 2020-09-22

Solving Urban Infrastructure Problems Using Smart City Technologies is the most complete guide for integrating next generation smart city technologies into the very foundation of urban areas worldwide, showing how to make urban areas more efficient, more sustainable, and safer. Smart cities are complex systems of systems that encompass all aspects of modern urban life. A key component of their success is creating an ecosystem of smart infrastructures that can work together to enable dynamic, real-time interactions between urban subsystems such as transportation, energy, healthcare, housing, food, entertainment, work, social interactions, and governance. Solving Urban Infrastructure Problems Using Smart City Technologies is a complete reference for building a holistic, system-level perspective on smart and sustainable cities, leveraging big data analytics and strategies for planning, zoning, and public policy. It offers in-depth coverage and practical solutions for how smart cities can utilize resident's intellectual and social capital, press environmental sustainability, increase personalization, mobility, and higher quality of life. Brings together experts from academia, government and industry to offer state-of-the-art solutions for urban system problems, showing how smart technologies can be used to improve the lives of the billions of people living in cities across the globe. Demonstrates practical implementation solutions through real-life case studies. Enhances reader comprehension with learning aid such as hands-on exercises, questions and answers, checklists, chapter summaries, chapter review questions, exercise problems, and more.

Internet of Things. Information Processing in an Increasingly Connected World - Leon Strous 2019-03-19

This open access book constitutes the refereed post-conference proceedings of the First IFIP International Cross-Domain Conference on Internet of Things, IFIP IoT 2018, held at the 24th IFIP World Computer Congress, WCC 2018, in Poznan, Poland, in September 2018. The 12 full papers presented were carefully reviewed and selected from 24 submissions. Also included in this volume are 4 WCC 2018 plenary contributions, an invited talk and a position paper from the IFIP domain

committee on IoT. The papers cover a wide range of topics from a technology to a business perspective and include among others hardware, software and management aspects, process innovation, privacy, power consumption, architecture, applications.

Smart Cities - Krishna Kumar 2022-05-04

This book discusses the various aspects of smart cities and their architecture along with the application of the latest technologies, including the Internet of Things (IoT) and artificial intelligence (AI). The concept of smart cities, their development, technological advancements, and issues related to them are discussed in detail. Smart Cities: Concepts, Practices, and Applications covers numerous topics, including energy utilities and the role of renewable energy for sustainable development, intelligent transport systems, traffic management, sewage and waste management, the impact of smart city development on the social and economic aspects of life, flexible communication technologies utilized in the development of smart cities, e-governance challenges, and implementation in smart cities. FEATURES Discusses the basic architecture of a smart city and its development concept. Covers the application of IoT and AI in the development of smart cities. Examines the impact of smart city development on social and economic aspects. Presents comprehensively intelligent transport systems and traffic management. This book will be useful for senior undergraduate and graduate students and professionals in electrical engineering, electronics and communication engineering, computer science, and civil engineering.

Smart Cities - Sergio Nesmachnow 2022

This book constitutes the thoroughly refereed proceedings of the 4th Ibero-American Congress, ICSC-CITIES 2021, held in Cancún, Mexico, in November - December 2021. Due to the COVID-19 pandemic the conference was partially held online. The 21 full papers and one short paper presented were carefully reviewed and selected from 112 submissions. The papers are organized in topical sections on computational intelligence for smart cities; urban informatics; internet of things, smart energy and smart grid.

Resilient and Responsible Smart Cities - Hassan Abdalla 2022

This book aims to establish a community with attention to land use to achieve sustainable development and meet the needs of today's society. Urban planning depends on engineering, architectural, social and political pillars. It pursues this by proposing solutions, regulating environmental pollution and non-sustainable use of available resources. It showcases and even triggers further debate about connections between sustainable development, urban planning and technology in hopes of achieving sustainable development models that sustain urban expansion and shape cities that improve the overall quality of life. It views urban planning and development as vital fields that ensure the application of revolutionary approaches with new materials and processes incorporated in the most efficient manner.

Smart Cities Policies and Financing - John Vacca 2022-01-19

Smart Cities Policies and Financing: Approaches and Solutions is the definitive professional reference for harnessing the full potential of policy making and financial planning in smart cities. It covers the effective tools for capturing the dynamic relations between people, policies, financing, and environments, and where they are most often useful and effective for all relevant stakeholders. The book examines the key role of science, technology, and innovation (STI) - especially in information and communications technologies - in the design, development, and management of smart cities policies and financing. It identifies the problems and offers practical solutions in implementation of smart infrastructure policies and financing. Smart Cities Policies and Financing is also about how the implementation of smart infrastructure projects (related to the challenges of the lack of financing and the application of suitable policies) underlines the key roles of science, technology and innovation (STI) communities in addressing these challenges and provides key policies and financing that will help guide the design and development of smart cities. Brings together experts from academia, government and industry to offer state-of-the-art solutions for improving the lives of billions of people in cities around the globe. Creates awareness among governments of the various policy tools

available, such as output-based contracting, public-private partnerships, procurement policies, long-term contracting, and targeted research funds in order to promote smart infrastructure implementation, and encouraging the use of such tools to shape markets for smart infrastructure and correct market failures. Ensures the inclusiveness of smart city projects by adequately addressing the special needs of marginalized sections of society including the elderly, persons with disabilities, and inhabitants of informal settlements and informal sectors. Ensures gender considerations in the design of smart cities and infrastructure through the use of data generated by smart systems to make cities safer and more responsive to the needs of women. Demonstrate practical implementation through real-life case studies. Enhances reader comprehension using learning aids such as hands-on exercises, checklists, chapter summaries, review questions, and an extensive appendix of additional resources.

Transportation and Power Grid in Smart Cities - Hussein T. Mouftah 2018-11-28

With the increasing worldwide trend in population migration into urban centers, we are beginning to see the emergence of the kinds of megacities which were once the stuff of science fiction. It is clear to most urban planners and developers that accommodating the needs of the tens of millions of inhabitants of those megalopolises in an orderly and uninterrupted manner will require the seamless integration of and real-time monitoring and response services for public utilities and transportation systems. Part speculative look into the future of the world's urban centers, part technical blueprint, this visionary book helps lay the groundwork for the communication networks and services on which tomorrow's "smart cities" will run. Written by a uniquely well-qualified author team, this book provides detailed insights into the technical requirements for the wireless sensor and actuator networks required to make smart cities a reality.

Nanotechnology for Light Pollution Reduction - Tuan Anh Nguyen 2022-09-07

Light is essential for living organisms; however, excessive light causes

adverse health conditions. This book covers the most recent progress on nanotechnology for reducing light pollution, discussing many approaches and technologies for controlling light pollution. The book explores the fundamentals of light and the causes of light pollution, delving into light pollution's social, economic, and ecological impacts, its effects on living beings and the environment, as well as possible solutions and methods of control. The text discusses smart lighting technology, covering the various smart nanomaterials, nanosensors, and nanodevices involved. It also explores smart lighting involving natural light from the sun, artificial skydomes, shadow-free/secondary light sources, and the basics of many emerging devices such as light-emitting diodes and photosensors.

Nanotechnology is key to providing a new route for the next generation of lighting devices and systems with reduced light pollution. This essential reference illuminates emerging technologies and their applications, providing new directions to scientists, researchers, and students to better understand the principles, technologies, and applications of nanotechnology in light pollution.

Unlocking the Strategic Use of Public Procurement in Bratislava, Slovak Republic - OECD 2021-12-09

Subnational governments carry out more than 60% of total public procurement in OECD countries. As such, public procurement can offer a powerful tool for cities to boost local growth and advance their strategic priorities, ranging from innovation and inclusion to the transition to a low-carbon economy.

Fighting Light Pollution - The International Dark-Sky Association 2012-04-04

The first practical guide to alleviating an increasingly prevalent environmental concern.

Artificial Intelligence, Machine Learning, and Optimization Tools for Smart Cities - Panos M. Pardalos 2021

This volume offers a wealth of interdisciplinary approaches to artificial intelligence, machine learning and optimization tools, which contribute to the optimization of urban features towards forming smart, sustainable, and livable future cities. Special features include: New research on the

design of city elements and smart systems with respect to new technologies and scientific thinking Discussions on the theoretical background that lead to smart cities for the future New technologies and principles of research that can promote ideas of artificial intelligence and machine learning in optimized urban environments The book engages students and researchers in the subjects of artificial intelligence, machine learning, and optimization tools in smart sustainable cities as eminent international experts contribute their research results and thinking in its chapters. Overall, its audience can benefit from a variety of disciplines including, architecture, engineering, physics, mathematics, computer science, and related fields.

Shaping Smart for Better Cities - Alessandro Aurigi 2020-11-14

Shaping Smart for Better Cities powerfully demonstrates the range of theoretical and practical challenges, opportunities and success factors involved in successfully deploying digital technologies in cities, focusing on the importance of recognizing local context and multi-layered urban relationships in designing successful urban interventions. The first section, 'Rethinking Smart (in) Places' interrogates the smart city from a theoretical vantage point. The second part, 'Shaping Smart Places' examines various case studies critically. Hence the volume offers an intellectual resource that expands on the current literature, but also provides a pedagogical resource to universities as well as a reflective opportunity for practitioners. The cases allow for an examination of the practical implications of smart interventions in space, whilst the theoretical reflections enable expansion of the literature. Students are encouraged to learn from case studies and apply that learning in design. Academics will gain from the learning embedded in the documentation of the case studies in different geographic contexts, while practitioners can apply their learning to the conceptualisation of new forms of technology use. Demonstrates how to adapt smart urban interventions for hyper-local context in geographic parameters, spatial relationships, and socio-political characteristics Provides a problem-solving approach based on specific smart place examples, applicable to real-life urban management Offers insights from numerous case studies of smart cities interventions

in real civic spaces

Smart Cities - Stan McClellan 2017-08-03

This book reviews the applications, technologies, standards, and other issues related to Smart Cities. The book is divided into broad topical sections including Vision & Reality, Technologies & Standards, Transportation Considerations, and Infrastructure & Environment. In these sections, authors who are experts in their fields present essential aspects of applications, technologies, requirements, and best-practices. In all cases, the authors have direct, substantive experience with the subject and present an important viewpoint driven by industry or governmental interests; the authors have each participated in the development and/or deployment of constituent technologies, standards, and applications, and share unique perspectives on key areas of the Smart City.

Sustainable Smart City Transitions - Luca Mora 2022-02-24

This book enhances the reader's understanding of the theoretical foundations, sociotechnical assemblage, and governance mechanisms of sustainable smart city transitions. Drawing on empirical evidence stemming from existing smart city research, the book begins by advancing a theory of sustainable smart city transitions, which forms bridges between smart city development studies and some of the key assumptions underpinning transition management and system innovation research, human geography, spatial planning, and critical urban scholarship. This interdisciplinary theoretical formulation details how smart city transitions unfold and how they should be conceptualized and enacted in order to be assembled as sustainable developments. The proposed theory of sustainable smart city transitions is then enriched by the findings of investigations into the planning and implementation of smart city transition strategies and projects. Focusing on different empirical settings, change dimensions, and analytical elements, the attention moves from the sociotechnical requirements of citywide transition pathways to the development of sector-specific smart city projects and technological innovations, in particular in the fields of urban mobility and urban governance. This book represents a relevant

reference work for academic and practitioner audiences, policy makers, and representative of smart city industries. The chapters in this book were originally published as a special issue of the Journal of Urban Technology.

Smart Cities - Jianbin Gao 2022-10-18

Smart Cities: Blockchain-Based Systems, Networks, and Data examines the various components that make up a smart city. It focuses on infrastructure, processes, and services and outlines approaches for services such as health, transport, energy, and more. With an underlying emphasis on blockchain networks, the authors examine ways to provide the management of resources and activities by creating a more secure and trustless operating systems where resources are more effectively allocated and managed. Features • Novel approaches toward the provision of smart city services • Detailed explanations of how a blockchain-based smart city network operates • Novel design and architecture for cutting-edge technologies such as energy systems and vehicular devices interacting with blockchain across smart cities • Monitoring of data flow and the movement of several data types across different components of a smart city • Comprehensive analysis of issues affecting entities across a smart city and the effects of blockchain-based solutions This book is a practical and detailed demonstration for researchers and industry professionals who would use blockchain technology for effective city management.

Green Computing in Smart Cities: Simulation and Techniques -

Balamurugan Balusamy 2020-09-07

The book collects the latest research and thinking from international experts on green computing and the smart city. The financial and environmental costs of energy are a concern in smart cities due to the high usage of computing, technology, security, IoT, communications, traffic, and other technologies. This book tackles this problem with a focus on computing, reporting on various approaches being taken worldwide, illustrated by several international case studies demonstrating these approaches. Researchers use this book as an up-to-date reference and engineers use it as a guide for the design and

implementation of real solutions.

Internet of Things: Enabling Technologies, Security and Social Implications - Santosh Kumar Pani 2021-01-13

This edited book presents point of view and the work being undertaken by active researchers in the domain of IOT and its applications with societal impact. The book is useful to other researchers for the understanding of the research domain and different points of views expressed by the experts in their contributed chapters. The contributions are from both industry and academia; hence, it provides a rich source of both theoretical and practical work going on in the research domain of IOT.

Smart Cities: A Data Analytics Perspective - Mohammad Ayoub Khan 2020-12-11

This book offers practical as well as conceptual knowledge of the latest trends, tools, techniques and methodologies of data analytics in smart cities. The smart city is an advanced technological area that is capable of understanding the environment by examining the data to improve the livability. The smart cities allow different kinds of wireless sensors to gather massive amounts, full speed and a broad range of city data. The smart city has a focus on data analytics facilitated through the IoT platforms. There is a need to customize the IoT architecture and infrastructures to address needs in application of specific domains of smart cities such as transportation, traffic, health and, environment. The smart cities will provide next generation development technologies for urbanization that includes the need of environmental sustainability, personalization, mobility, optimum energy utilization, better administrative services and higher quality of life. Each chapter presents the reader with an in-depth investigation regarding the possibility of data analytics perspective in smart cities. The book presents cutting-edge and future perspectives of smart cities, where industry experts, scientists, and scholars exchange ideas and experience about surrounding frontier technologies, breakthrough and innovative solutions and applications.

Artificial Intelligence for Smart Cities and Villages: Advanced Technologies, Development, and Challenges - Megha Bhushan

2022-08-15

Smart cities and villages have enhanced the quality of lives of residents. Various computer-assisted technologies have been harnessed for the development of smart cities and villages in order to provide solutions for common and niche urban problems. The development of smart environments has been possible due on advances in computing power and artificial intelligence (AI) that have allowed the deployment of scalable technologies. Artificial Intelligence for Smart Cities and Smart Villages: Advanced Technologies, Development, and Challenges summarizes the role of AI in planning and designing smart solutions for urban and rural environments. This book is divided into three sections to impart a better understanding of the topics to readers. These sections are: 1) Demystifying smart cities and villages: A traditional perspective, 2) Smart innovations for rural lifestyle management solutions, and 3) Case studies. Through this book, readers will be able to understand various advanced technologies that are vital to the development of smart cities and villages. The book presents 15 chapters that present effective solutions to urban and rural challenges. Concepts highlighted in chapters include smart farms, indoor object classification systems, smart transportation, blockchains for medical information, humanoid robots for rural education, IoT devices for farming, and much more. This book is intended for undergraduate and graduate engineering students across all disciplines, security providers in the IT and related fields, and trainees working for infrastructure management companies. Researchers and consultants at all levels working in the areas of artificial intelligence, machine learning, IoT, blockchain, network security, and cloud computing will also find the contents beneficial in planning projects involving smart environments.

Nanosensors for Smart Cities - Baoguo Han 2020-02-13

Nanosensors for Smart Cities covers the fundamental design concepts and emerging applications of nanosensors for the creation of smart city infrastructures. Examples of major applications include logistics management, where nanosensors could be used in active transport tracking devices for smart tracking and tracing, and in agri-food

productions, where nanosensors are used in nanochips for identity, and food inspection, and smart storage. This book is essential reading for researchers working in the field of advanced sensors technology, smart city technology and nanotechnology, and stakeholders involved in city management. Nanomaterials based sensors (nanosensors) can offer many advantages over their microcounterparts, including lower power consumption, high sensitivity, lower concentration of analytes, and smaller interaction distance between object and sensor. With the support of artificial intelligence (AI) tools, such as fuzzy logic, genetic algorithms, neural networks, and ambient-intelligence, sensor systems are becoming smarter. Provides information on the fabrication and fundamental design concepts of nanosensors for intelligent systems Explores how nanosensors are being used to better monitor and maintain infrastructure services, including street lighting, traffic management and pollution control Assesses the challenges for creating nanomaterials-enhanced sensors for mass-market consumer products

Security and Privacy Applications for Smart City Development - Sharvari Chandrashekhar Tamane 2020-10-01

This book explores the fundamentals of smart cities along with issues, controversies, problems and applications concerning security and privacy in smart city development. Future smart cities must incorporate innovations like smart rainwater harvesting, smart street lighting, digital identity management, solar energy, intelligent transport systems and emerging communication applications. The target audience of the book includes professionals, researchers, academics, advanced-level students, technology developers, doctors and biologists working in the field of smart city applications. Professionals will find innovative ideas for marketing and research, while developers can use various technologies like IoT and block chain to develop the applications discussed here. As the book shows, by integrating new technologies, the cities of the future are becoming a reality today.

Internet of Energy for Smart Cities - Anish Jindal 2021-07-19

Machine learning approaches has the capability to learn and adapt to the constantly evolving demands of large Internet-of-energy (IoE) network.

The focus of this book is on using the machine learning approaches to present various solutions for IoE network in smart cities to solve various research gaps such as demand response management, resource management and effective utilization of the underlying ICT network. It provides in-depth knowledge to build the technical understanding for the reader to pursue various research problems in this field. Moreover, the example problems in smart cities and their solutions using machine learning are provided as relatable to the real-life scenarios. Aimed at Graduate Students, Researchers in Computer Science, Electrical Engineering, Telecommunication Engineering, Internet of Things, Machine Learning, Green computing, Smart Grid, this book: Covers all aspects of Internet of Energy (IoE) and smart cities including research problems and solutions. Points to the solutions provided by machine learning to optimize the grids within a smart city set-up. Discusses relevant IoE design principles and architecture. Helps to automate various services in smart cities for energy management. Includes case studies to show the effectiveness of the discussed schemes.

Data Science and Big Data Analytics in Smart Environments - Marta Chinnici 2021

"Many applications generate large datasets, like social networking and social influence programs, smart cities applications, smart house environments, Cloud applications, public web sites, scientific experiments and simulations, data warehouse, monitoring platforms, and e-government services. This book will primarily encompass practical approaches that advance research in all aspects of data processing, data analytics, data processing in Cloud/Edge/Fog systems, having a large variety of tools and software to manage them. The book focuses on focuses on topics covering algorithms, architectures, management models, high performance computing techniques and large-scale distributed systems"--

Machine Learning for Smart Environments/Cities - Gonçalo Marques 2022

This book introduces machine learning and its applications in smart environments/cities. At this stage, a comprehensive understanding of

smart environment/city applications is critical for supporting future research. This book includes chapters written by researchers from different countries across the globe and identifies critical threads in research and also gaps that open up new and challenging lines of research for the future. Recent advances are discussed, and thorough reviews introduce readers to critical domains. The discussion on key research topics presented in this book accelerates smart city and smart environment implementations based on IoT technologies. Consequently, this book supports future research activities aimed at developing future IoT architectures for smart environments/cities.

Holistic Approach for Decision Making Towards Designing Smart Cities - George Cristian Lazaroiu 2021

This edited volume examines strategies to make future cities more sustainable. The aim of these and other initiatives of the recent past, is to transform our cities into smarter cities. Thereby, these solutions are determined to boost clean electricity and pollution reduction, improve the life of citizens and transform city environment and regulatory structures. As the EUs ambition is to become carbon-neutral until 2050, the outlined projects also consider fostering economy prosperity and social wellness and environmental sustainability. The greatest challenge being already built urban spaces that need to be transformed quickly and at low costs. The book will analyze future smart cities in three centric dimensions: energy and sustainable development, smart infrastructures for smart cities, social involvement and economic prosperity. With its global approach, the volume is highly useful for professionals involved in city planning and urban ecology.

From Internet of Things to Smart Cities - Hongjian Sun 2017-09-01

From Internet of Things to Smart Cities: Enabling Technologies explores the information and communication technologies (ICT) needed to enable real-time responses to current environmental, technological, societal, and economic challenges. ICT technologies can be utilized to help with reducing carbon emissions, improving resource utilization efficiency, promoting active engagement of citizens, and more. This book aims to introduce the latest ICT technologies and to promote international

collaborations across the scientific community, and eventually, the general public. It consists of three tightly coupled parts. The first part explores the involvement of enabling technologies from basic machine-to-machine communications to Internet of Things technologies. The second part of the book focuses on state of the art data analytics and security techniques, and the last part of the book discusses the design of human-machine interfaces, including smart home and cities. Features Provides an extended literature review of relevant technologies, in addition to detailed comparison diagrams, making new readers be easier to grasp fundamental and wide knowledge Contains the most recent research results in the field of communications, signal processing and computing sciences for facilitating smart homes, buildings, and cities Includes future research directions in Internet of Things, smart homes, smart buildings, smart grid, and smart cities Presents real examples of applying these enabling technologies to smart homes, transportation systems and cities With contributions from leading experts, the book follows an easy structure that not only presents timely research topics in-depth, but also integrates them into real world applications to help readers to better understand them.

Digital Cities Roadmap - Arun Solanki 2021-04-13

DIGITAL CITIES ROADMAP This book details applications of technology to efficient digital city infrastructure and its planning, including smart buildings. Rapid urbanization, demographic changes, environmental changes, and new technologies are changing the views of urban leaders on sustainability, as well as creating and providing public services to tackle these new dynamics. Sustainable development is an objective by which the processes of planning, implementing projects, and development is aimed at meeting the needs of modern communities without compromising the potential of future generations. The advent of Smart Cities is the answer to these problems. *Digital Cities Roadmap* provides an in-depth analysis of design technologies that lay a solid foundation for sustainable buildings. The book also highlights smart automation technologies that help save energy, as well as various performance indicators needed to make construction easier. The book

aims to create a strong research community, to have a deep understanding and the latest knowledge in the field of energy and comfort, to offer solid ideas in the nearby future for sustainable and resilient buildings. These buildings will help the city grow as a smart city. The smart city has also a focus on low energy consumption, renewable energy, and a small carbon footprint. Audience The information provided in this book will be of value to researchers, academicians and industry professionals interested in IoT-based architecture and sustainable buildings, energy efficiency and various tools and methods used to develop green technologies for construction in smart cities.

ISUW 2019 - Reji Kumar Pillai 2021-08-19

This book presents selected articles from INDIA SMART UTILITY WEEK (ISUW 2019), which is the fifth edition of the Conference cum Exhibition on Smart Grids and Smart Cities, organized by India Smart Grid Forum from 12-16 March 2019 at Manekshaw Centre, New Delhi, India. ISGF is a public private partnership initiative of the Ministry of Power, Govt. of India with the mandate of accelerating smart grid deployments across the country. This book gives current scenario updates of Indian power sector business. It also highlights various disruptive technologies for power sector business.

Advances in Practical Applications of Agents, Multi-Agent Systems, and Complex Systems Simulation. The PAAMS Collection - Frank Dignum 2022-11-13

This book constitutes the proceedings of the 20th International Conference on Practical Applications of Agents and Multi-Agent Systems, PAAMS 2022, held in L'Aquila, Italy in July 2022. The 37 full papers in this book were reviewed and selected from 67 submissions. Another 10 demonstrations papers were selected from 11 submissions are presented here as short papers. The papers deal with the application and validation of agent-based models, methods, and technologies in a number of key applications areas, including: advanced models and learning, agent-based programming, decision-making, education and social interactions, formal and theoretic models, health and safety, mobility and the city,

swarms and task allocation.

Beyond Smart Cities - José A. Ondiviela 2021-10-21

Cities are experiencing unprecedented times. In addition of managing the best possible post-pandemic recovery, Cities are at the beginning of the 4th industrial revolution, and all want to play a relevant role in it. To achieve this, they must retain and attract the necessary talent. There is a fierce competition where cities transform to become as attractive as possible. But what makes a city attractive (from emotional and rational sides) to talented citizens? For mayors and city directors: how can I prepare my city for this goal? What kind of transformations in the medium-long term should I develop? And in the short term, what processes and technologies (SmartCity) should I put in place? And from the point of view of citizens: how do I choose the best city to develop my full potential? Which one offers me the best citizenship contract? Where am I going to enjoy the best services with the highest quality of life and lower taxes/cost of life? In addition, the city must be attractive, with a strong identity and dynamism and promising future. Can I find the cities that best suit my aesthetic and emotional preferences, and that also offer me the services that I consider a priority at the lowest cost to my pocket? Find all the answers in this book.

Making Smart Cities More Playable - Anton Nijholt 2019-07-23

This book explores the ways in which the broad range of technologies that make up the smart city infrastructure can be harnessed to incorporate more playfulness into the day-to-day activities that take place within smart cities, making them not only more efficient but also more enjoyable for the people who live and work within their confines. The book addresses various topics that will be of interest to playable cities stakeholders, including the human-computer interaction and game designer communities, computer scientists researching sensor and actuator technology in public spaces, urban designers, and (hopefully) urban policymakers. This is a follow-up to another book on Playable Cities edited by Anton Nijholt and published in 2017 in the same book series, Gaming Media and Social Effects.

IoT and Big Data Analytics for Smart Cities - Sathiyaraj Rajendran

2022-12-01

The book *IoT and Big Data Analytics (IoT-BDA) for Smart Cities - A Global Perspective*, emphasizes the challenges, architectural models, and intelligent frameworks with smart decisionmaking systems using Big Data and IoT with case studies. The book illustrates the benefits of Big Data and IoT methods in framing smart systems for smart applications. The text is a coordinated amalgamation of research contributions and industrial applications in the field of smart cities. Features:

- Provides the necessity of convergence of Big Data Analytics and IoT techniques in smart city application.
- Challenges and Roles of IoT and Big Data in Smart City applications.
- Provides Big Data-IoT intelligent smart systems in a global perspective.
- Provides a predictive framework that can handle the traffic on abnormal days, such as weekends and festival holidays.
- Gives various solutions and ideas for smart traffic development in smart cities.
- Gives a brief idea of the available algorithms/techniques of Big Data and IoT and guides in developing a

solution for smart city applications. This book is primarily aimed at IT professionals. Undergraduates, graduates, and researchers in the area of computer science and information technology will also find this book useful.

Immersive Technology in Smart Cities - Sagaya Aurelia 2021-07-07

This book presents recent trends and enhancements in the convergence of immersive technology and smart cities. The authors discuss various domains such as medical education, construction, brain interface, interactive storytelling, edification, and journalism in relation to combining smart cities, IoT and immersive technologies. The book sets up a medium to promulgate insights and in depth understanding among experts in immersive technologies, IoT, HCI and associated establishments. The book also includes case studies, survey, models, algorithms, frameworks and implementations in storytelling, smart museum, medical education, journalism and more. Various practitioners, academicians and researchers in the domain contribute to the book.