

Big Data And Internet Of Things A Roadmap For Smart Environments Studies In Computational Intelligence

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The Internet of Things and Big Data Analytics - Pethuru Raj
2020-06-07

This book comprehensively conveys the theoretical and practical aspects of IoT and big data analytics with the solid contributions from practitioners as well as academicians. This book examines and expounds the unique capabilities of the big data analytics platforms in capturing, cleansing and crunching IoT device/sensor data in order to extricate actionable insights. A number of experimental case studies and real-world scenarios are incorporated in this book in order to instigate our book readers. This book Analyzes current research and development in the domains of IoT and big data analytics Gives an overview of latest trends and transitions happening in the IoT data analytics space Illustrates the various platforms, processes, patterns, and practices for simplifying and streamlining IoT data analytics The Internet of Things and Big Data Analytics: Integrated Platforms and Industry Use Cases examines and accentuates how the multiple challenges at the cusp of IoT and big data can be fully met. The device ecosystem is growing steadily. It is forecast that there will be billions of connected devices in the years to come. When these IoT devices, resource-constrained as well as resource-intensive, interact with one another locally and remotely, the amount of multi-structured data generated, collected, and stored is bound to grow exponentially. Another prominent trend is the integration of IoT devices with cloud-based applications, services, infrastructures, middleware solutions, and databases. This book examines the pioneering technologies and tools emerging and evolving in order to collect, pre-process, store, process and analyze data heaps in order to disentangle actionable insights.

Multimedia Big Data Computing for IoT Applications - Sudeep Tanwar
2019-07-17

This book considers all aspects of managing the complexity of Multimedia Big Data Computing (MMBD) for IoT applications and develops a comprehensive taxonomy. It also discusses a process model that addresses a number of research challenges associated with MMBD, such as scalability, accessibility, reliability, heterogeneity, and Quality of Service (QoS) requirements, presenting case studies to demonstrate its application. Further, the book examines the layered architecture of MMBD computing and compares the life cycle of both big data and MMBD. Written by leading experts, it also includes numerous solved examples, technical descriptions, scenarios, procedures, and algorithms.

Big-Data Analytics for Cloud, IoT and Cognitive Computing - Kai Hwang
2017-03-17

The definitive guide to successfully integrating social, mobile, Big-Data analytics, cloud and IoT principles and technologies The main goal of this book is to spur the development of effective big-data computing operations on smart clouds that are fully supported by IoT sensing, machine learning and analytics systems. To that end, the authors draw upon their original research and proven track record in the field to describe a practical approach integrating big-data theories, cloud design principles, Internet of Things (IoT) sensing, machine learning, data analytics and Hadoop and Spark programming. Part 1 focuses on data science, the roles of clouds and IoT devices and frameworks for big-data computing. Big data analytics and cognitive machine learning, as well as cloud architecture, IoT and cognitive systems are explored, and mobile cloud-IoT-interaction frameworks are illustrated with concrete system design examples. Part 2 is devoted to the principles of and algorithms for machine learning, data analytics and deep learning in big data applications. Part 3 concentrates on cloud programming software libraries from MapReduce to Hadoop, Spark and TensorFlow and describes business, educational, healthcare and social media applications for those tools. The first book describing a practical approach to

integrating social, mobile, analytics, cloud and IoT (SMACT) principles and technologies Covers theory and computing techniques and technologies, making it suitable for use in both computer science and electrical engineering programs Offers an extremely well-informed vision of future intelligent and cognitive computing environments integrating SMACT technologies Fully illustrated throughout with examples, figures and approximately 150 problems to support and reinforce learning Features a companion website with an instructor manual and PowerPoint slides www.wiley.com/go/hwangIoT Big-Data Analytics for Cloud, IoT and Cognitive Computing satisfies the demand among university faculty and students for cutting-edge information on emerging intelligent and cognitive computing systems and technologies. Professionals working in data science, cloud computing and IoT applications will also find this book to be an extremely useful working resource.

Handbook of Research on Cloud Computing and Big Data Applications in IoT - Gupta, B. B. 2019-04-12

Today, cloud computing, big data, and the internet of things (IoT) are becoming indubitable parts of modern information and communication systems. They cover not only information and communication technology but also all types of systems in society including within the realms of business, finance, industry, manufacturing, and management. Therefore, it is critical to remain up-to-date on the latest advancements and applications, as well as current issues and challenges. The Handbook of Research on Cloud Computing and Big Data Applications in IoT is a pivotal reference source that provides relevant theoretical frameworks and the latest empirical research findings on principles, challenges, and applications of cloud computing, big data, and IoT. While highlighting topics such as fog computing, language interaction, and scheduling algorithms, this publication is ideally designed for software developers, computer engineers, scientists, professionals, academicians, researchers, and students.

Big Data Analytics in Cybersecurity - Onur Savas 2017-09-18

Big data is presenting challenges to cybersecurity. For an example, the Internet of Things (IoT) will reportedly soon generate a staggering 400 zettabytes (ZB) of data a year. Self-driving cars are predicted to churn out 4000 GB of data per hour of driving. Big data analytics, as an emerging analytical technology, offers the capability to collect, store, process, and visualize these vast amounts of data. Big Data Analytics in Cybersecurity examines security challenges surrounding big data and provides actionable insights that can be used to improve the current practices of network operators and administrators. Applying big data analytics in cybersecurity is critical. By exploiting data from the networks and computers, analysts can discover useful network information from data. Decision makers can make more informative decisions by using this analysis, including what actions need to be performed, and improvement recommendations to policies, guidelines, procedures, tools, and other aspects of the network processes. Bringing together experts from academia, government laboratories, and industry, the book provides insight to both new and more experienced security professionals, as well as data analytics professionals who have varying levels of cybersecurity expertise. It covers a wide range of topics in cybersecurity, which include: Network forensics Threat analysis Vulnerability assessment Visualization Cyber training. In addition, emerging security domains such as the IoT, cloud computing, fog computing, mobile computing, and cyber-social networks are examined. The book first focuses on how big data analytics can be used in different aspects of cybersecurity including network forensics, root-cause analysis, and security training. Next it discusses big data challenges and solutions in such emerging cybersecurity domains as fog computing, IoT, and mobile app security. The book concludes by presenting the tools and

datasets for future cybersecurity research.

Multimedia Technologies in the Internet of Things Environment - Raghvendra Kumar 2020-09-28

This book provides theoretical and practical approach in the area of multimedia and IOT applications and performance analysis. Further, multimedia communication, deep learning models to multimedia data and the new (IOT) approaches are also covered. It addresses the complete functional framework in the area of multimedia data, IOT and smart computing techniques. The book proposes a comprehensive overview of the state-of-the-art research work on multimedia analysis in IOT applications. It bridges the gap between multimedia concepts and solutions by providing the current IOT frameworks, their applications in multimedia analysis, the strengths and limitations of the existing methods, and the future directions in multimedia IOT analytics.

Internet of Things and Big Data Technologies for Next Generation Healthcare - Chintan Bhatt 2017-01-01

This comprehensive book focuses on better big-data security for healthcare organizations. Following an extensive introduction to the Internet of Things (IoT) in healthcare including challenging topics and scenarios, it offers an in-depth analysis of medical body area networks with the 5th generation of IoT communication technology along with its nanotechnology. It also describes a novel strategic framework and computationally intelligent model to measure possible security vulnerabilities in the context of e-health. Moreover, the book addresses healthcare systems that handle large volumes of data driven by patients' records and health/personal information, including big-data-based knowledge management systems to support clinical decisions. Several of the issues faced in storing/processing big data are presented along with the available tools, technologies and algorithms to deal with those problems as well as a case study in healthcare analytics. Addressing trust, privacy, and security issues as well as the IoT and big-data challenges, the book highlights the advances in the field to guide engineers developing different IoT devices and evaluating the performance of different IoT techniques. Additionally, it explores the impact of such technologies on public, private, community, and hybrid scenarios in healthcare. This book offers professionals, scientists and engineers the latest technologies, techniques, and strategies for IoT and big data.

Internet of Things and Big Data Applications - Valentina E. Balas 2020-02-24

This book provides essential future directions for IoT and Big Data research. Thanks to rapid advances in sensors and wireless technology, Internet of Things (IoT)-related applications are attracting more and more attention. As more devices are connected, they become potential components for smart applications. Thus, there is a new global interest in these applications in various domains such as health, agriculture, energy, security and retail. The main objective of this book is to reflect the multifaceted nature of IoT and Big Data in a single source.

Accordingly, each chapter addresses a specific domain that is now being significantly impacted by the spread of soft computing

Challenges and Opportunities for the Convergence of IoT, Big Data, and Cloud Computing - V. Sathiyamoorthi 2020

"This book focuses on the applications, issues, and challenges in the convergence of the internet of things, big data, and cloud computing"--

Big Data Analytics for Smart and Connected Cities - Dey, Nilanjan 2018-09-07

To continue providing people with safe, comfortable, and affordable places to live, cities must incorporate techniques and technologies to bring them into the future. The integration of big data and interconnected technology, along with the increasing population, will lead to the necessary creation of smart cities. Big Data Analytics for Smart and Connected Cities is a pivotal reference source that provides vital research on the application of the integration of interconnected technologies and big data analytics into the creation of smart cities. While highlighting topics such as energy conservation, public transit planning, and performance measurement, this publication explores technology integration in urban environments as well as the methods of planning cities to implement these new technologies. This book is ideally designed for engineers, professionals, researchers, and technology developers seeking current research on technology implementation in urban settings.

Medical Big Data and Internet of Medical Things - Aboul Ella Hassanien 2018-10-25

Big data and the Internet of Things (IoT) play a vital role in prediction systems used in biological and medical applications, particularly for

resolving issues related to disease biology at different scales. Modelling and integrating medical big data with the IoT helps in building effective prediction systems for automatic recommendations of diagnosis and treatment. The ability to mine, process, analyse, characterize, classify and cluster a variety and wide volume of medical data is a challenging task. There is a great demand for the design and development of methods dealing with capturing and automatically analysing medical data from imaging systems and IoT sensors. Addressing analytical and legal issues, and research on integration of big data analytics with respect to clinical practice and clinical utility, architectures and clustering techniques for IoT data processing, effective frameworks for removal of misclassified instances, practicality of big data analytics, methodological and technical issues, potential of Hadoop in managing healthcare data is the need of the hour. This book integrates different aspects used in the field of healthcare such as big data, IoT, soft computing, machine learning, augmented reality, organs on chip, personalized drugs, implantable electronics, integration of bio-interfaces, and wearable sensors, devices, practical body area network (BAN) and architectures of web systems. Key Features: Addresses various applications of Medical Big Data and Internet of Medical Things in real time environment Highlights recent innovations, designs, developments and topics of interest in machine learning techniques for classification of medical data Provides background and solutions to existing challenges in Medical Big Data and Internet of Medical Things Provides optimization techniques and programming models to parallelize the computationally intensive tasks in data mining of medical data Discusses interactions, advantages, limitations, challenges and future perspectives of IoT based remote healthcare monitoring systems. Includes data privacy and security analysis of cryptography methods for the Web of Medical Things (WoMT) Presents case studies on the next generation medical chair, electronic nose and pill cam are also presented.

Integration of Cloud Computing with Internet of Things - Monika Mangla 2021-03-08

The book aims to integrate the aspects of IoT, Cloud computing and data analytics from diversified perspectives. The book also plans to discuss the recent research trends and advanced topics in the field which will be of interest to academicians and researchers working in this area. Thus, the book intends to help its readers to understand and explore the spectrum of applications of IoT, cloud computing and data analytics. Here, it is also worth mentioning that the book is believed to draw attention on the applications of said technology in various disciplines in order to obtain enhanced understanding of the readers. Also, this book focuses on the researches and challenges in the domain of IoT, Cloud computing and Data analytics from perspectives of various stakeholders.

Internet of Things and Big Data Analytics for Smart Generation - Valentina E. Balas 2018-12-30

This book discusses emerging technologies in the field of the Internet of Things and big data, an area that will be scaled in next two decades. Written by a team of leading experts, it is the only book focusing on the broad areas of both the Internet of things and big data. The thirteen chapters present real-time experimental methods and theoretical explanations, as well as the implementation of these technologies through various applications. Offering a blend of theory and hands-on practices, the book enables graduate, postgraduate and research students who are involved in real-time project scaling techniques to understand projects and their execution. It is also useful for senior computer students, researchers and industry workers who are involved in experimenting with the Internet of Things and big data technologies, helping them to solve the real-time problem. Moreover, the chapters covering cutting-edge technologies help multidisciplinary researchers who are bridging the gap of two different outset real-time problems.

Towards Smart World - Lavanya Sharma 2020-12-13

Towards Smart World: Homes to Cities Using Internet of Things provides an overview of basic concepts from the rising of machines and communication to IoT for making cities smart, real-time applications domains, related technologies, and their possible solutions for handling relevant challenges. This book highlights the utilization of IoT for making cities smart and its underlying technologies in real-time application areas such as emergency departments, intelligent traffic systems, indoor and outdoor securities, automotive industries, environmental monitoring, business entrepreneurship, facial recognition, and motion-based object detection. Features The book covers the challenging issues related to sensors, detection, and tracking of moving objects, and solutions to handle relevant challenges. It contains the most recent research analysis in the domain of communications, signal processing, and computing

sciences for facilitating smart homes, buildings, environmental conditions, and cities. It presents the readers with practical approaches and future direction for using IoT in smart cities and discusses how it deals with human dynamics, the ecosystem, and social objects and their relation. It describes the latest technological advances in IoT and visual surveillance with their implementations. This book is an ideal resource for IT professionals, researchers, undergraduate or postgraduate students, practitioners, and technology developers who are interested in gaining deeper knowledge and implementing IoT for smart cities, real-time applications areas, and technologies, and a possible set of solutions to handle relevant challenges. Dr. Lavanya Sharma is an Assistant Professor in the Amity Institute of Information Technology at Amity University UP, Noida, India. She has been a recipient of several prestigious awards during her academic career. She is an active nationally recognized researcher who has published numerous papers in her field.

Internet of Things: Novel Advances and Envisioned Applications - D. P. Acharjya 2017-04-19

This book focuses on a combination of theoretical advances in the Internet of Things, cloud computing and its real-life applications to serve society. The book discusses technological innovations, authentication, mobility support and security, group rekeying schemes and a range of concrete applications. The Internet has restructured not only global interrelations, but also an unbelievable number of personal characteristics. Machines are increasingly able to control innumerable autonomous gadgets via the Internet, creating the Internet of Things, which facilitates intelligent communication between humans and things, and among things. The Internet of Things is an active area of current research, and technological advances have been supported by real-life applications to establish their soundness. The material in this book includes concepts, figures, graphs, and tables to guide researchers through the Internet of Things and its applications for society.

Securing IoT and Big Data - Vijayalakshmi Saravanan 2020-12-16

This book covers IoT and Big Data from a technical and business point of view. The book explains the design principles, algorithms, technical knowledge, and marketing for IoT systems. It emphasizes applications of big data and IoT. It includes scientific algorithms and key techniques for fusion of both areas. Real case applications from different industries are offering to facilitate ease of understanding the approach. The book goes on to address the significance of security algorithms in combining IoT and big data which is currently evolving in communication technologies. The book is written for researchers, professionals, and academicians from interdisciplinary and transdisciplinary areas. The readers will get an opportunity to know the conceptual ideas with step-by-step pragmatic examples which makes ease of understanding no matter the level of the reader.

Internet of Things for Smart Cities - Waleed Ejaz 2018-10-12

This book introduces the concept of smart city as the potential solution to the challenges created by urbanization. The Internet of Things (IoT) offers novel features with minimum human intervention in smart cities. This book describes different components of Internet of Things (IoT) for smart cities including sensor technologies, communication technologies, big data analytics and security.

Internet of Things and Big Data Analytics Toward Next-Generation Intelligence - Nilanjan Dey 2017-08-14

This book highlights state-of-the-art research on big data and the Internet of Things (IoT), along with related areas to ensure efficient and Internet-compatible IoT systems. It not only discusses big data security and privacy challenges, but also energy-efficient approaches to improving virtual machine placement in cloud computing environments. Big data and the Internet of Things (IoT) are ultimately two sides of the same coin, yet extracting, analyzing and managing IoT data poses a serious challenge. Accordingly, proper analytics infrastructures/platforms should be used to analyze IoT data. Information technology (IT) allows people to upload, retrieve, store and collect information, which ultimately forms big data. The use of big data analytics has grown tremendously in just the past few years. At the same time, the IoT has entered the public consciousness, sparking people's imaginations as to what a fully connected world can offer. Further, the book discusses the analysis of real-time big data to derive actionable intelligence in enterprise applications in several domains, such as in industry and agriculture. It explores possible automated solutions in daily life, including structures for smart cities and automated home systems based on IoT technology, as well as health care systems that manage large amounts of data (big data) to improve clinical decisions.

The book addresses the security and privacy of the IoT and big data technologies, while also revealing the impact of IoT technologies on several scenarios in smart cities design. Intended as a comprehensive introduction, it offers in-depth analysis and provides scientists, engineers and professionals the latest techniques, frameworks and strategies used in IoT and big data technologies.

Big Data Analytics for Internet of Things - Tausifa Jan Saleem 2021-03-29

BIG DATA ANALYTICS FOR INTERNET OF THINGS Discover the latest developments in IoT Big Data with a new resource from established and emerging leaders in the field Big Data Analytics for Internet of Things delivers a comprehensive overview of all aspects of big data analytics in Internet of Things (IoT) systems. The book includes discussions of the enabling technologies of IoT data analytics, types of IoT data analytics, challenges in IoT data analytics, demand for IoT data analytics, computing platforms, analytical tools, privacy, and security. The distinguished editors have included resources that address key techniques in the analysis of IoT data. The book demonstrates how to select the appropriate techniques to unearth valuable insights from IoT data and offers novel designs for IoT systems. With an abiding focus on practical strategies with concrete applications for data analysts and IoT professionals, Big Data Analytics for Internet of Things also offers readers: A thorough introduction to the Internet of Things, including IoT architectures, enabling technologies, and applications An exploration of the intersection between the Internet of Things and Big Data, including IoT as a source of Big Data, the unique characteristics of IoT data, etc. A discussion of the IoT data analytics, including the data analytical requirements of IoT data and the types of IoT analytics, including predictive, descriptive, and prescriptive analytics A treatment of machine learning techniques for IoT data analytics Perfect for professionals, industry practitioners, and researchers engaged in big data analytics related to IoT systems, Big Data Analytics for Internet of Things will also earn a place in the libraries of IoT designers and manufacturers interested in facilitating the efficient implementation of data analytics strategies.

Internet of Things and Data Analytics Handbook - Hwaiyu Geng 2017-01-10

This book examines the Internet of Things (IoT) and Data Analytics from a technical, application, and business point of view. Internet of Things and Data Analytics Handbook describes essential technical knowledge, building blocks, processes, design principles, implementation, and marketing for IoT projects. It provides readers with knowledge in planning, designing, and implementing IoT projects. The book is written by experts on the subject matter, including international experts from nine countries in the consumer and enterprise fields of IoT. The text starts with an overview and anatomy of IoT, ecosystem of IoT, communication protocols, networking, and available hardware, both present and future applications and transformations, and business models. The text also addresses big data analytics, machine learning, cloud computing, and consideration of sustainability that are essential to be both socially responsible and successful. Design and implementation processes are illustrated with best practices and case studies in action. In addition, the book: Examines cloud computing, data analytics, and sustainability and how they relate to IoT over the scope of consumer, government, and enterprise applications Includes best practices, business model, and real-world case studies Hwaiyu Geng, P.E., is a consultant with Amica Research (www.AmicaResearch.org, Palo Alto, California), promoting green planning, design, and construction projects. He has had over 40 years of manufacturing and management experience, working with Westinghouse, Applied Materials, Hewlett Packard, and Intel on multi-million high-tech projects. He has written and presented numerous technical papers at international conferences. Mr. Geng, a patent holder, is also the editor/author of Data Center Handbook (Wiley, 2015).

Big Data and Internet of Things: A Roadmap for Smart Environments - Nik Bessis 2014-03-11

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.

Advanced Intelligent Systems for Sustainable Development (AI2SD'2019) - Mostafa Ezziyani 2019-10-11

This proceedings book presents extended versions of papers on advanced intelligent systems for networks and system selected from the second edition of the International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD'2019), which was held on 8-11 July 2019 in Marrakech, Morocco. The book explores a number of aspects of networks and systems design issues, and focuses on the latest research developments in a number of areas, including various aspects of modern networking such as smart networked systems, network protocols and performance, security and privacy, mobile and wireless systems, Internet of things, artificial intelligence and expert systems, and cloud computing, as well as enabling technologies. The book also examines the area of intelligence, comprehensively examining a range of important topics like intelligent collaborative systems for work and learning, security, organization, management and autonomic computing for intelligent networking and collaborative systems, wireless and sensor systems for intelligent networking and collaborative systems, data mining and knowledge management for intelligent networking and collaborative systems, data for Internet of things, and cloud computing. Each chapter presents the state of the art in a specific topic as well as the results of research and laboratory experiments, and successful applications. The book is intended for academic and industry researchers and telecommunication network engineers wanting to gain insights into these areas, particularly in the context of Industry 4.0.

Big Data Analytics for Cyber-Physical Systems - Guido Dartmann 2019-07-15

Big Data Analytics in Cyber-Physical Systems: Machine Learning for the Internet of Things examines sensor signal processing, IoT gateways, optimization and decision-making, intelligent mobility, and implementation of machine learning algorithms in embedded systems. This book focuses on the interaction between IoT technology and the mathematical tools used to evaluate the extracted data of those systems. Each chapter provides the reader with a broad list of data analytics and machine learning methods for multiple IoT applications. Additionally, this volume addresses the educational transfer needed to incorporate these technologies into our society by examining new platforms for IoT in schools, new courses and concepts for universities and adult education on IoT and data science. . Bridges the gap between IoT, CPS, and mathematical modelling. Features numerous use cases that discuss how concepts are applied in different domains and applications. Provides "best practices", "winning stories" and "real-world examples" to complement innovation. Includes highlights of mathematical foundations of signal processing and machine learning in CPS and IoT.

Cognitive Computing for Big Data Systems Over IoT - Arun Kumar Sangaiah 2017-12-30

This book brings a high level of fluidity to analytics and addresses recent trends, innovative ideas, challenges and cognitive computing solutions in big data and the Internet of Things (IoT). It explores domain knowledge, data science reasoning and cognitive methods in the context of the IoT, extending current data science approaches by incorporating insights from experts as well as a notion of artificial intelligence, and performing inferences on the knowledge The book provides a comprehensive overview of the constituent paradigms underlying cognitive computing methods, which illustrate the increased focus on big data in IoT problems as they evolve. It includes novel, in-depth fundamental research contributions from a methodological/application in data science accomplishing sustainable solution for the future perspective. Mainly

focusing on the design of the best cognitive embedded data science technologies to process and analyze the large amount of data collected through the IoT, and aid better decision making, the book discusses adapting decision-making approaches under cognitive computing paradigms to demonstrate how the proposed procedures as well as big data and IoT problems can be handled in practice. This book is a valuable resource for scientists, professionals, researchers, and academicians dealing with the new challenges and advances in the specific areas of cognitive computing and data science approaches.

Analytics for the Internet of Things (IoT) - Andrew Minter 2017-07-24

Break through the hype and learn how to extract actionable intelligence from the flood of IoT data About This Book Make better business decisions and acquire greater control of your IoT infrastructure Learn techniques to solve unique problems associated with IoT and examine and analyze data from your IoT devices Uncover the business potential generated by data from IoT devices and bring down business costs Who This Book Is For This book targets developers, IoT professionals, and those in the field of data science who are trying to solve business problems through IoT devices and would like to analyze IoT data. IoT enthusiasts, managers, and entrepreneurs who would like to make the most of IoT will find this equally useful. A prior knowledge of IoT would be helpful but is not necessary. Some prior programming experience would be useful What You Will Learn Overcome the challenges IoT data brings to analytics Understand the variety of transmission protocols for IoT along with their strengths and weaknesses Learn how data flows from the IoT device to the final data set Develop techniques to wring value from IoT data Apply geospatial analytics to IoT data Use machine learning as a predictive method on IoT data Implement best strategies to get the most from IoT analytics Master the economics of IoT analytics in order to optimize business value In Detail We start with the perplexing task of extracting value from huge amounts of barely intelligible data. The data takes a convoluted route just to be on the servers for analysis, but insights can emerge through visualization and statistical modeling techniques. You will learn to extract value from IoT big data using multiple analytic techniques. Next we review how IoT devices generate data and how the information travels over networks. You'll get to know strategies to collect and store the data to optimize the potential for analytics, and strategies to handle data quality concerns. Cloud resources are a great match for IoT analytics, so Amazon Web Services, Microsoft Azure, and PTC ThingWorx are reviewed in detail next. Geospatial analytics is then introduced as a way to leverage location information. Combining IoT data with environmental data is also discussed as a way to enhance predictive capability. We'll also review the economics of IoT analytics and you'll discover ways to optimize business value. By the end of the book, you'll know how to handle scale for both data storage and analytics, how Apache Spark can be leveraged to handle scalability, and how R and Python can be used for analytic modeling. Style and approach This book follows a step-by-step, practical approach to combine the power of analytics and IoT and help you get results quickly

Computer Networks, Big Data and IoT - A.Pasumpon Pandian 2021-06-21

This book presents best selected research papers presented at the International Conference on Computer Networks, Big Data and IoT (ICCBi 2020), organized by Vaigai College Engineering, Madurai, Tamil Nadu, India, during 15-16 December 2020. The book covers original papers on computer networks, network protocols and wireless networks, data communication technologies and network security. The book is a valuable resource and reference for researchers, instructors, students, scientists, engineers, managers and industry practitioners in those important areas.

New Trends and Applications in Internet of Things (IoT) and Big Data Analytics - Rohit Sharma 2022-06-17

This book focuses on the use of The Internet of Things (IoT) and big data in business intelligence, data management, Hadoop, machine learning, cloud, smart cities, etc. IoT and big data emerged from the early 2000s data boom, driven forward by many of the early internet and technology companies. The Internet of Things (IoT) is an interconnection of several devices, networks, technologies, and human resources to achieve a common goal. There are a variety of IoT-based applications being used in different sectors and have succeeded in providing huge benefits to the users. The generation of big data by IoT has ruptured the existing data processing capacity of IoT and recommends to adopt the data analytics to strengthen solutions. The success of IoT depends upon the influential association of big data analytics. New technologies like search engines, mobile devices, and industrial machines provided as much data as

companies could handle—and the scale continues to grow. In a study conducted by IDC, the market intelligence firm estimated that the global production of data would grow 10x between 2015 and 2020. So, the proposed book covers up all the aspects in the field discuss above.

Handbook of IoT and Big Data - Vijender Kumar Solanki 2019-02-21

This multi-contributed handbook focuses on the latest workings of IoT (internet of Things) and Big Data. As the resources are limited, it's the endeavor of the authors to support and bring the information into one resource. The book is divided into 4 sections that covers IoT and technologies, the future of Big Data, algorithms, and case studies showing IoT and Big Data in various fields such as health care, manufacturing and automation. Features Focuses on the latest workings of IoT and Big Data Discusses the emerging role of technologies and the fast-growing market of Big Data Covers the movement toward automation with hardware, software, and sensors, and trying to save on energy resources Offers the latest technology on IoT Presents the future horizons on Big Data

Emerging Trends in IoT and Integration with Data Science, Cloud Computing, and Big Data Analytics - Taser, Pelin Yildirim 2021-11-05

The internet of things (IoT) has emerged to address the need for connectivity and seamless integration with other devices as well as big data platforms for analytics. However, there are challenges that IoT-based applications face including design and implementation issues; connectivity problems; data gathering, storing, and analyzing in cloud-based environments; and IoT security and privacy issues. *Emerging Trends in IoT and Integration with Data Science, Cloud Computing, and Big Data Analytics* is a critical reference source that provides theoretical frameworks and research findings on IoT and big data integration. Highlighting topics that include wearable sensors, machine learning, machine intelligence, and mobile computing, this book serves professionals who want to improve their understanding of the strategic role of trust at different levels of the information and knowledge society. It is therefore of most value to data scientists, computer scientists, data analysts, IT specialists, academicians, professionals, researchers, and students working in the field of information and knowledge management in various disciplines that include but are not limited to information and communication sciences, administrative sciences and management, education, sociology, computer science, etc. Moreover, the book provides insights and supports executives concerned with the management of expertise, knowledge, information, and organizational development in different types of work communities and environments.

Big Data-Enabled Internet of Things - Muhammad Usman Shahid Khan 2020-01-10

The fields of Big Data and the Internet of Things (IoT) have seen tremendous advances, developments, and growth in recent years. The IoT is the inter-networking of connected smart devices, buildings, vehicles and other items which are embedded with electronics, software, sensors and actuators, and network connectivity that enable these objects to collect and exchange data. The IoT produces a lot of data. Big data describes very large and complex data sets that traditional data processing application software is inadequate to deal with, and the use of analytical methods to extract value from data. This edited book covers analytical techniques for handling the huge amount of data generated by the Internet of Things, from architectures and platforms to security and privacy issues, applications, and challenges as well as future directions.

Big Data, IoT, and Machine Learning - Rashmi Agrawal 2020-09-01

The idea behind this book is to simplify the journey of aspiring readers and researchers to understand Big Data, IoT and Machine Learning. It also includes various real-time/offline applications and case studies in the fields of engineering, computer science, information security and cloud computing using modern tools. This book consists of two sections: Section I contains the topics related to Applications of Machine Learning, and Section II addresses issues about Big Data, the Cloud and the Internet of Things. This brings all the related technologies into a single source so that undergraduate and postgraduate students, researchers, academicians and people in industry can easily understand them. Features Addresses the complete data science technologies workflow Explores basic and high-level concepts and services as a manual for those in the industry and at the same time can help beginners to understand both basic and advanced aspects of machine learning Covers data processing and security solutions in IoT and Big Data applications Offers adaptive, robust, scalable and reliable applications to develop solutions for day-to-day problems Presents security issues and data migration techniques of NoSQL databases

Predictive Intelligence Using Big Data and the Internet of Things - Gupta,

P.K. 2018-12-28

With the recent growth of big data and the internet of things (IoT), individuals can now upload, retrieve, store, and collect massive amounts of information to help drive decisions and optimize processes. Due to this, a new age of predictive computing is taking place, and data can now be harnessed to predict unknown occurrences or probabilities based on data collected in real time. *Predictive Intelligence Using Big Data and the Internet of Things* highlights state-of-the-art research on predictive intelligence using big data, the IoT, and related areas to ensure quality assurance and compatible IoT systems. Featuring coverage on predictive application scenarios to discuss these breakthroughs in real-world settings and various methods, frameworks, algorithms, and security concerns for predictive intelligence, this book is ideally designed for academicians, researchers, advanced-level students, and technology developers.

Blockchain and Machine Learning for e-Healthcare Systems -

Balusamy Balamurugan 2020-11-13

Blockchain and machine learning technologies can mitigate healthcare issues such as slow access to medical data, poor system interoperability, lack of patient agency, and data quality and quantity for medical research. Blockchain technology facilitates and secures the storage of information in such a way that doctors can see a patient's entire medical history, but researchers see only statistical data instead of any personal information. Machine learning can make use of this data to notice patterns and give accurate predictions, providing more support for the patients and also in research related fields where there is a need for accurate data to predict credible results.

Innovative Healthcare Systems for the 21st Century - Hassan

Quadrat-Ullah 2017-05-11

This book presents the latest in decision-making tools, techniques, and solutions for policy makers to utilize in overcoming the challenges faced by healthcare systems. With contributions from experts world-wide, an array of healthcare management models, techniques, and integrative solutions are presented, drawing on econometric, system dynamics, and agent-based models as well as state-of-the-art empirical studies. As total healthcare spending (both total expenditures on health as a percentage of GDP and average spending on per capita) increases across most of the world's economies, healthcare systems continue to face challenges in terms of cost, quality, and access, as a result of its fragmented nature. Consequently, healthcare managers and policy makers require innovative integrative approaches and solutions to better manage complex, dynamic healthcare systems. This volume offers researchers and policy makers an insightful and critical review of the state of the art in healthcare modeling, with a particular focus on system dynamics, agent-based models, and modern empirical studies. It will be of interest to those in the fields of health, business management, and information systems.

Handbook of Research on Big Data and the IoT - Kaur, Gurjit 2019-03-29

The increase in connected devices in the internet of things (IoT) is leading to an exponential increase in the data that an organization is required to manage. To successfully utilize IoT in businesses, big data analytics are necessary in order to efficiently sort through the increased data. The combination of big data and IoT can thus enable new monitoring services and powerful processing of sensory data streams. The *Handbook of Research on Big Data and the IoT* is a pivotal reference source that provides vital research on emerging trends and recent innovative applications of big data and IoT, challenges facing organizations and the implications of these technologies on society, and best practices for their implementation. While highlighting topics such as bootstrapping, data fusion, and graph mining, this publication is ideally designed for IT specialists, managers, policymakers, analysts, software engineers, academicians, and researchers.

Big Data and The Internet of Things - Robert Stackowiak 2015-05-07

Enterprise Information Architecture for a New Age: Big Data and The Internet of Things, provides guidance in designing an information architecture to accommodate increasingly large amounts of data, massively large amounts of data, not only from traditional sources, but also from novel sources such everyday objects that are fast becoming wired into global Internet. No business can afford to be caught out by missing the value to be mined from the increasingly large amounts of available data generated by everyday devices. The text provides background as to how analytical solutions and enterprise architecture methodologies and concepts have evolved (including the roles of data warehouses, business intelligence tools, predictive analytics, data discovery, Big Data, and the impact of the Internet of Things). Then you're taken through a series of steps by which to define a future state

architecture and create a plan for how to reach that future state. Enterprise Information Architecture for a New Age: Big Data and The Internet of Things helps you gain an understanding of the following: Implications of Big Data from a variety of new data sources (including data from sensors that are part of the Internet of Things) upon an information architecture How establishing a vision for data usage by defining a roadmap that aligns IT with line-of-business needs is a key early step The importance and details of taking a step-by-step approach when dealing with shifting business challenges and changing technology capabilities How to mitigate risk when evaluating existing infrastructure and designing and deploying new infrastructure Enterprise Information Architecture for a New Age: Big Data and The Internet of Things combines practical advice with technical considerations. Author Robert Stackowiak and his team are recognized worldwide for their expertise in large data solutions, including analytics. Don't miss your chance to read this book and gain the benefit of their advice as you look forward in thinking through your own choices and designing your own architecture to accommodate the burgeoning explosion in data that can be analyzed and converted into valuable information to drive your business forward toward success.

Foundations of Data Science Based Healthcare Internet of Things - Parikshit N. Mahalle 2021-01-22

This book offers a basic understanding of the Internet of Things (IoT), its design issues and challenges for healthcare applications. It also provides details of the challenges of healthcare big data, role of big data in healthcare and techniques, and tools for IoT in healthcare. This book offers a strong foundation to a beginner. All technical details that include healthcare data collection unit, technologies and tools used for the big data analytics implementation are explained in a clear and organized format.

Internet of Things, Smart Computing and Technology: A Roadmap Ahead - Nilanjan Dey 2020-02-14

This book addresses a broad range of topics concerning machine learning, big data, the Internet of things (IoT), and security in the IoT. Its goal is to bring together several innovative studies on these areas, in order to help researchers, engineers, and designers in several interdisciplinary domains pursue related applications. It presents an overview of the various algorithms used, focusing on the advantages and disadvantages of each in the fields of machine learning and big data. It also covers next-generation computing paradigms that are expected to support wireless networking with high data transfer rates and autonomous decision-making capabilities. In turn, the book discusses IoT applications (e.g. healthcare applications) that generate a huge amount of sensor data and imaging data that must be handled correctly for further processing. In the traditional IoT ecosystem, cloud computing offers a solution for the efficient management of huge amounts of data, thanks to its ability to access shared resources and provide a common infrastructure in a ubiquitous manner. Though these new technologies are invaluable, they also reveal serious IoT security challenges. IoT applications are vulnerable to various types of attack such as eavesdropping, spoofing and false data injection, the man-in-the-middle attack, replay attack, denial-of-service attack, jamming attack, flooding attack, etc. These and other security issues in the Internet of things are explored in detail. In addition to highlighting outstanding research and recent advances from around the globe, the book reports on current challenges and future directions in the IoT. Accordingly, it offers

engineers, professionals, researchers, and designers an applied-oriented resource to support them in a broad range of interdisciplinary areas.

Internet of Things - Neil Wilkins 2019-03-08

If you want to learn about the Internet of Things, then keep reading... You were just woken up in the middle of the night by smart lightbulbs in your house blasting at full power for no reason. Your bleary-eyed investigation shows they tried to download a firmware update and failed. At that moment, Alexa starts quietly whispering sweet nonsense to herself in the corner and Roomba starts slamming into the nearest wall. What do you do? Is your house haunted or have the machines finally started an uprising? Neither - it's just another day in the IoT wonderland. This book reveals the concepts and methods powering perhaps the most ambitious technological concept of the twenty-first century - the Internet of Things (IoT) - and parades all the ridiculously named gadgets techies imagined to saturate the market before the competition. Mystical, cheap and scalable, the idea of IoT attracts creative grifters of all shapes and sizes to try their luck in pushing yet another completely unnecessary gadget to the market in hopes of fleecing gullible buyers. Some of the topics you'll find in the book are: Origins of IoT IoT Security Ethical Hacking Internet of Things Under The Cushy Foot of Tech Giants The Power of Infinite Funds IoT Toys Bio-robotics Predictive Analytics Machine Learning Artificial Intelligence Cybersecurity Big Data Business Intelligence Augmented Reality Virtual Reality Our Future And much, much more If you want to learn more about the Internet of Things, then scroll up and click "add to cart"!

Connected Environments for the Internet of Things - Zaigham Mahmood 2018-01-05

This comprehensive text/reference presents a broad-ranging overview of device connectivity in distributed computing environments, supporting the vision of an Internet of Things (IoT). Expert perspectives are provided by an international selection of researchers from both industry and academia, covering issues of communication, security, privacy, interoperability, networking, access control, and authentication. In addition to discussing state-of-the-art research and practice, the book includes corporate analyses offering a balanced view of benefits and limitations, and numerous case studies illustrating the challenges and practical solutions. Topics and features: discusses issues of security and privacy in connected environments, with a specific focus on the impact of the IoT paradigm on enterprise information systems; examines the challenges of managing big data in IoT environments, and proposes cloud computing-based solutions to the limitations inherent in the IoT paradigm; suggests approaches to overcome service-level interoperability problems in the IoT environment; introduces a mobile IoT simulator designed to evaluate the behavior of IoT systems, in addition to a novel approach to manage hyper-connectivity in the IoT; describes the use of the Essence framework to model software development methods, and highlights the benefits of integrating data from smart buildings and IoT devices; presents an asymmetric schema matching mechanism for IoT interoperability, and explores the topic of automatic provenance capture at the middleware level; reviews emerging network topologies and communication technologies, and advises on the adoption of a data distribution service as a middleware platform for IoT systems. This practically-oriented volume serves as a complete reference for students, researchers and practitioners of distributed computing, providing insights into the latest approaches, technologies, and frameworks relevant to the IoT environment.