

Cache Enabled Small Cell Networks With Local User Interest

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Federated Learning for Wireless Networks - Choong Seon Hong 2022-01-01

Recently machine learning schemes have attained significant attention as key enablers for next-generation wireless systems. Currently, wireless systems are mostly using machine learning schemes that are based on centralizing the training and inference processes by migrating the end-devices data to a third party centralized location. However, these schemes lead to end-devices privacy leakage. To address these issues, one can use a distributed machine learning at network edge. In this context, federated learning (FL) is one of most important distributed learning algorithm, allowing devices to train a shared machine learning model while keeping data locally. However, applying FL in wireless networks and optimizing the performance involves a range of research topics. For example, in FL, training machine learning models require communication between wireless devices and edge servers via wireless links. Therefore, wireless impairments such as uncertainties among wireless channel states, interference, and noise significantly affect the performance of FL. On the other hand, federated-reinforcement learning leverages distributed computation power and data to solve complex optimization problems that arise in various use cases, such as interference alignment, resource management, clustering, and network control. Traditionally, FL makes the assumption that edge devices will unconditionally participate in the tasks when invited, which is not practical in reality due to the cost of model training. As such, building incentive mechanisms is indispensable for FL networks. This book provides a comprehensive overview of FL for wireless networks. It is divided into three main parts: The first part briefly discusses the fundamentals of FL for wireless networks, while the second part comprehensively examines the design and analysis of wireless FL, covering resource optimization, incentive mechanism, security and privacy. It also presents several solutions based on optimization theory, graph theory, and game theory to optimize the performance of federated learning in wireless networks. Lastly, the third part describes several applications of FL in wireless networks.

Interference Mitigation and Energy Management in 5G

Heterogeneous Cellular Networks - Yang, Chungang 2016-11-22

In recent years, wireless networks have become more ubiquitous and integrated into everyday life. As such, it is increasingly imperative to research new methods to boost cost-effectiveness for spectrum and energy efficiency. Interference Mitigation and Energy Management in 5G Heterogeneous Cellular Networks is a pivotal reference source for the latest research on emerging network architectures and mitigation technology to enhance cellular network performance and dependency. Featuring extensive coverage across a range of relevant perspectives and topics, such as interference alignment, resource allocation, and high-speed mobile environments, this book is ideally designed for engineers, professionals, practitioners, upper-level students, and academics seeking current research on interference and energy management for 5G heterogeneous cellular networks.

Cloud Based 5G Wireless Networks - Yin Zhang 2016-11-09

This SpringerBrief introduces key techniques for 5G wireless networks. The authors cover the development of wireless networks that led to 5G, and how 5G mobile communication technology (5G) can no longer be defined by a single business model or a typical technical characteristic. The discussed networks functions and services include Network Foundation Virtualization (N-FV), Cloud Radio Access Networks (Cloud-RAN), and Mobile Cloud Networking (MCN). The benefits of cloud platforms are examined, as are

definable networking and green wireless networking. Other related and representative projects on 5G are mobile and wireless communications enablers for the Twenty-Twenty Information Society, Multi-hop Cellular Networks, Network Function as-a-Service over Virtualized Infrastructures, iJOIN, and Nuage Virtualized Services Platform. Major applications of 5G range from RAN sharing and Multi-Operator Core Networks to mobile convergence. Enhancing the user experience by providing smart and customized services, 5G will support the explosive growth of big data, mobile internet, digital media, and system efficiency. This SpringerBrief is designed for professionals, researchers, and academics working in networks or system applications. Advanced-level students of computer science or computer engineering will also find the content valuable.

Autonomous Airborne Wireless Networks - Muhammad Ali Imran 2021-07-29

AUTONOMOUS AIRBORNE WIRELESS NETWORKS Discover what lies beyond the bleeding-edge of autonomous airborne networks with this authoritative new resource Autonomous Airborne Wireless Networks delivers an insightful exploration on recent advances in the theory and practice of using airborne wireless networks to provide emergency communications, coverage and capacity expansion, information dissemination, and more. The distinguished engineers and editors have selected resources that cover the fundamentals of airborne networks, including channel models, recent regulation developments, self-organized networking, AI-enabled flying networks, and notable applications in a variety of industries. The book evaluates advances in the cutting-edge of unmanned aerial vehicle wireless network technology while offering readers new ideas on how airborne wireless networks can support various applications expected of future networks. The rapidly developing field is examined from a fresh perspective, one not just concerned with ideas of control, trajectory optimization, and navigation. Autonomous Airborne Wireless Networks considers several potential use cases for the technology and demonstrates how it can be integrated with concepts from self-organized network technology and artificial intelligence to deliver results in those cases. Readers will also enjoy: A thorough discussion of distributed drone base station positioning for emergency cellular networks using reinforcement learning (AI-enabled trajectory optimization) An exploration of unmanned aerial vehicle-to-wearables (UAV2W) indoor radio propagation channel measurements and modelling An up-to-date treatment of energy minimization in UAV trajectory design for delay tolerant emergency communication Examinations of cache-enabled UAVs, 3D MIMO for airborne networks, and airborne networks for Internet of Things communications Perfect for telecom engineers and industry professionals working on identifying practical and efficient concepts tailored to overcome challenges facing unmanned aerial vehicles providing wireless communications, Autonomous Airborne Wireless Networks also has a place on the bookshelves of stakeholders, regulators, and research agencies working on the latest developments in UAV communications.

Algorithms and Architectures for Parallel Processing - Jaideep Vaidya 2018-12-07

The four-volume set LNCS 11334-11337 constitutes the proceedings of the 18th International Conference on Algorithms and Architectures for Parallel Processing, ICA3PP 2018, held in Guangzhou, China, in November 2018. The 141 full and 50 short papers presented were carefully reviewed and selected from numerous submissions. The papers are organized in topical

sections on Distributed and Parallel Computing; High Performance Computing; Big Data and Information Processing; Internet of Things and Cloud Computing; and Security and Privacy in Computing.

Peer-to-Peer Computing for Mobile Networks - Maria Papadopoulou 2009-02-27

This book presents research results on data dissemination in mobile networks and peer-to-peer systems for mobile devices. The main focus is a novel resource-sharing mechanism for mobile devices that introduces a new paradigm of information-sharing cooperation among mobile devices not necessarily connected to the internet. The book is geared to the needs of researchers and practitioners in industry, and is also suitable for advanced-level students in computer science and electrical engineering.

Wireless Edge Caching - Thang X. Vu 2020-08-31

Understand both uncoded and coded caching techniques in future wireless network design. Expert authors present new techniques that will help you to improve backhaul, load minimization, deployment cost reduction, security, energy efficiency and the quality of the user experience. Covering topics from high-level architectures to specific requirement-oriented caching design and analysis, including big-data enabled caching, caching in cloud-assisted 5G networks, and security, this is an essential resource for academic researchers, postgraduate students and engineers working in wireless communications.

Information Theory for Data Communications and Processing - Shlomo Shamai (Shitz) 2021-01-13

Modern, current, and future communications/processing aspects motivate basic information-theoretic research for a wide variety of systems for which we do not have the ultimate theoretical solutions (for example, a variety of problems in network information theory as the broadcast/interference and relay channels, which mostly remain unsolved in terms of determining capacity regions and the like). Technologies such as 5/6G cellular communications, Internet of Things (IoT), and mobile edge networks, among others, not only require reliable rates of information measured by the relevant capacity and capacity regions, but are also subject to issues such as latency vs. reliability, availability of system state information, priority of information, secrecy demands, energy consumption per mobile equipment, sharing of communications resources (time/frequency/space), etc. This book, composed of a collection of papers that have appeared in the Special Issue of the Entropy journal dedicated to "Information Theory for Data Communications and Processing", reflects, in its eleven chapters, novel contributions based on the firm basic grounds of information theory. The book chapters address timely theoretical and practical aspects that constitute both interesting and relevant theoretical contributions, as well as direct implications for modern current and future communications systems.

Network Coding - Tracey Ho 2008-04-14

Network coding promises to significantly impact the way communications networks are designed, operated, and understood. This book presents a unified and intuitive overview of the theory, applications, challenges, and future directions of this emerging field, and is a must-have resource for those working in wireline or wireless networking. • Uses an engineering approach - explains the ideas and practical techniques • Covers mathematical underpinnings, practical algorithms, code selection, security, and network management • Discusses key topics of inter-session (non-multicast) network coding, lossy networks, lossless networks, and subgraph-selection algorithms Starting with basic concepts, models, and theory, then covering a core subset of results with full proofs, Ho and Lun provide an authoritative introduction to network coding that supplies both the background to support research and the practical considerations for designing coded networks. This is an essential resource for graduate students and researchers in electronic and computer engineering and for practitioners in the communications industry.

Small Cell Networks - Holger Claussen 2017-11-29

The first and only up-to-date guide offering complete coverage of HetNets—written by top researchers and engineers in the field Small Cell Networks: Deployment, Management, and Optimization addresses key problems of the cellular network evolution towards HetNets. It focuses on the latest developments in heterogeneous

and small cell networks, as well as their deployment, operation, and maintenance. It also covers the full spectrum of the topic, from academic, research, and business to the practice of HetNets in a coherent manner. Additionally, it provides complete and practical guidelines to vendors and operators interested in deploying small cells. The first comprehensive book written by well-known researchers and engineers from Nokia Bell Labs, Small Cell Networks begins with an introduction to the subject—offering chapters on capacity scaling and key requirements of future networks. It then moves on to sections on coverage and capacity optimization, and interference management. From there, the book covers mobility management, energy efficiency, and small cell deployment, ending with a section devoted to future trends and applications. The book also contains: The latest review of research outcomes on HetNets based on both theoretical analyses and network simulations Over 200 sources from 3GPP, the Small Cell Forum, journals and conference proceedings, and all prominent topics in HetNet An overview of indoor coverage techniques such as metrocells, picocells and femtocells, and their deployment and optimization Real case studies as well as innovative research results based on both simulation and measurements Detailed information on simulating heterogeneous networks as used in the examples throughout the book Given the importance of HetNets for future wireless communications, Small Cell Networks: Deployment, Management, and Optimization is sure to help decision makers as they consider the migration of services to HetNets. It will also appeal to anyone involved in information and communication technology.

International Conference on Intelligent Data Communication Technologies and Internet of Things (ICICI) 2018 - Jude Hemanth 2018-12-20

This book discusses data communication and computer networking, communication technologies and the applications of IoT (Internet of Things), big data, cloud computing and healthcare informatics. It explores, examines and critiques intelligent data communications and presents inventive methodologies in communication technologies and IoT. Aimed at researchers and academicians who need to understand the importance of data communication and advanced technologies in IoT, it offers different perspectives to help readers increase their knowledge and motivates them to conduct research in the area, highlighting various innovative ideas for future research.

6GN for Future Wireless Networks - Xiaofei Wang 2021-03-01

This book constitutes the proceedings of the Third International Conference on 6G for Future Wireless Networks, 6GN 2020, held in Tianjin, China, in August 2020. The conference was held virtually due to the COVID-19 pandemic. The 45 full papers were selected from 109 submissions and present the state of the art and practical applications of 6G technologies. The papers are arranged thematically on network scheduling and optimization; wireless system and platform; intelligent applications; network performance evaluation; cyber security and privacy; technologies for private 5G/6G.

Mobile Edge Caching in Heterogeneous Vehicular Networks - Huaqing Wu 2021-12-02

To support smart vehicular services especially in the future driverless era, the vehicular networks are expected to support high-bandwidth content delivery and reliable accessibility of multifarious applications. However, the limited radio spectrum resources, the inflexibility in accommodating dynamic traffic demands, and the geographically constrained fixed infrastructure deployment of current terrestrial networks pose great challenges in ensuring ubiquitous, flexible, and reliable network connectivity. This book investigates mobile edge content caching and delivery in heterogeneous vehicular networks (HetVNs) to provide better service quality for vehicular users with resource utilization efficiency enhancement. Specifically, this book introduces the background of HetVNs and mobile edge caching, provides a comprehensive overview of mobile edge caching-assisted HetVNet techniques in supporting vehicular content delivery, and proposes/designs mobile edge content caching and delivery schemes in different HetVNet scenarios respectively to enhance vehicular content delivery performance. Afterward, this book outlines open issues and research directions in future mobile edge caching-assisted space-air-ground integrated vehicular networks.

The topics addressed in this book are crucial for both the academic community and industry, since mobile edge caching in heterogeneous networks has become an essential building block for the communication systems. The systematic principle of this book provides valuable insights on the efficient exploitation of heterogeneous network resources to fully unleash their differential merits in supporting vehicular applications. In addition, this book considers different HetVNet scenarios from terrestrial HetVNs to air-ground HetVNs and space-air-ground HetVNs, which can provide a general overview for interested readers with a comprehensive understanding of applying mobile edge caching techniques in enhancing vehicular content delivery performance, and offer a systematized view for researchers and practitioners in the field of mobile edge caching to help them design and optimize the desired vehicular content delivery systems. Provides in-depth studies on mobile edge content caching and delivery scheme design for three typical HetVNet scenarios; Comprehensively covers the analysis, design, and optimization of the mobile edge content caching-assisted HetVNs; Systematically addresses vehicle mobility, network service interruptions, and dynamic service request distribution issues in the mobile edge content caching and delivery.

Mobile Computing Handbook - Mohammad Ilyas 2004-12-28

The debut of small, inexpensive, yet powerful portable computers has coincided with the exponential growth of the Internet, making it possible to access computing resources and information at nearly any location at almost any time. This new trend, mobile computing, is poised to become the main technology driver for a decade to come. There are many

Communications and Networking - Honghao Gao 2021-02-01

This proceedings constitutes the refereed proceedings of the 15th EAI International Conference on Communications and Networking, ChinaCom 2020, held in November 2020 in Shanghai, China. Due to COVID-19 pandemic the conference was held virtually. The 54 papers presented were carefully selected from 143 submissions. The papers are organized in topical sections on Transmission Optimization in Edge Computing; Performance and Scheduling Optimization in Edge Computing; Mobile Edge Network System; Communication Routing and Control; Transmission and Load Balancing; Edge Computing and Distributed Machine Learning; Deep Learning.

Coded Content Caching for Wireless Networks - Jad Hachem 2017

The increase in mobile Internet usage has created a need to optimize content delivery in cellular networks. In emerging technologies such as 5G, heterogeneous networks are proposed, which consist of sparsely deployed cellular base stations (BS) with wide coverage but low data rate, combined with a dense network of wireless access points (AP) of small coverage but relatively high data rate. We envisage equipping the APs with a local cache. When a group of users request some files, their demands are served by a (common) broadcast from one or more BSs, which is aided by side information placed a priori in the APs. Therefore, there is a tradeoff between the size of the cache and the size of the broadcast. Our goal is to design schemes that optimize this tradeoff. Traditional caching techniques, which have proved efficient in the wired Internet, are insufficient to handle the explosion in multimedia demand in wireless networks. The seminal work by Maddah-Ali and Niesen [“Fundamental limits of caching,” *IEEE Transactions on Information Theory*, May 2014] introduced an information-theoretic framework to study this problem and proposed the so-called “coded caching” technique that takes advantage of the broadcast nature of wireless to send coded multicast messages to many users at once, thus greatly improving the transmission rate. This original work assumed a caching system with an error-free broadcast link between the content library and the users, focused on equally popular files, and assumed that each user has one exclusive local cache. Inspired by this work, this thesis studies more general coded caching problems within this information-theoretic framework. Broadly speaking, we focus on non-uniform content popularity as well as more general network topologies. First, we consider a system where the files desired by the users are not all equally popular. We adopt a “multi-level” popularity model where files are partitioned into multiple popularity classes. Under this model, we study the

behavior of the system as the total number of users, as compared to the number of caches, varies. Furthermore, we allow a more complex topology by requiring some users to connect to multiple caches at once. We find approximately optimal strategies for the two extreme cases: when the number of users per cache is very large, and when each cache has exactly one user. An interesting dichotomy is observed where the approximately optimal strategies required for these two extremes are very different. Finally, we provide a heuristic for “discretizing” common popularity distributions such as Zipf into multiple levels, and numerically evaluate its performance. Second, we study the caching problem when we are allowed to assign users to caches after their demands are known, under some restrictions. Specifically, we divide the caches into several clusters, and we assume that each user can be assigned to one cache from a specific cluster and that each cache can serve no more than one user. Focusing on a stochastic Zipf popularity model, we find that there are regimes in which coded caching is no longer efficient. Instead, a strategy that consists in replicating files across clusters and performs an uncoded delivery dominates certain regimes. We compare these two schemes and find the regimes in which each is more efficient, as a function of cache memory, cluster size, and skewness of popularity. Finally, we show that each scheme is approximately optimal in some of these regimes. Third, we return to the uniform popularity model in order to study more complicated networks than the error-free broadcast network. Our main focus is on Gaussian interference networks, where caches are placed at both the transmitters (BSs) and the receivers (APs). We propose a separation-based approach that creates separate network and physical layers, with a multiple-multicast message set to act as an interface between them. At the physical layer, we focus on transmitting this message set across the interference channel; at the network layer, we solve the caching problem using the message set as a set of error-free links replacing the channel. We show that this architecture is approximately optimal under high SNR. Among the implications of this result is that placing common information between the transmitters cannot give more than a constant-factor benefit. Moreover, we show that, when the receiver memory is large, a small number of transmitters is enough to obtain most of the benefits.

Green, Energy-Efficient and Sustainable Networks - Josip Lorincz 2020-01-21

The book *Green, Energy-Efficient and Sustainable Networks* provides insights and solutions for a range of problems in the field of obtaining greener, energy-efficient, and sustainable networks. The book contains the outcomes of the Special Issue on “Green, Energy-Efficient and Sustainable Networks” of the *Sensors* journal. Seventeen high-quality papers published in the Special Issue have been collected and reproduced in this book, demonstrating significant achievements in the field. Among the published papers, one paper is an editorial and one is a review, while the remaining 15 works are research articles. The published papers are self-contained peer-reviewed scientific works that are authored by more than 75 different contributors with both academic and industry backgrounds. The editorial paper gives an introduction to the problem of information and communication technology (ICT) energy consumption and greenhouse gas emissions, presenting the state of the art and future trends in terms of improving the energy-efficiency of wireless networks and data centers, as the major energy consumers in the ICT sector. In addition, the published articles aim to improve energy efficiency in the fields of software-defined networking, Internet of things, machine learning, authentication, energy harvesting, wireless relay systems, routing metrics, wireless sensor networks, device-to-device communications, heterogeneous wireless networks, and image sensing. The last paper is a review that gives a detailed overview of energy-efficiency improvements and methods for the implementation of fifth-generation networks and beyond. This book can serve as a source of information in industrial, teaching, and/or research and development activities. The book is a valuable source of information, since it presents recent advances in different fields related to greening and improving the energy-efficiency and sustainability of those ICTs particularly addressed in this book

Ad Hoc Networks - Yifeng Zhou 2018-01-18

This book constitutes the refereed proceedings of the 9th International Conference on Ad Hoc Networks, AdHocNets 2017, held in Niagara Falls, Ontario, USA, in September 2017. The 19 full papers were selected from 30 submissions and cover a variety of network paradigms including mobile ad hoc networks (MANETs), sensor networks, vehicular networks, underwater networks, airborne networks, underground networks, personal area networks, device-to-device (D2D) communications in 5G cellular networks, and home networks. The papers present a wide range of applications in civilian, commercial, and military areas.

Small Cell Networks - Tony Q. S. Quek 2013-05-02

This comprehensive resource explores state-of-the-art advances in the successful deployment and operation of small cell networks. A broad range of technical challenges, and possible solutions, are addressed, including practical deployment considerations and interference management techniques, all set within the context of the most recent cutting-edge advances. Key aspects covered include 3GPP standardisation, applications of stochastic geometry, PHY techniques, MIMO techniques, handover and radio resource management, including techniques designed to make the best possible use of the available spectrum. Detailed technical information is provided throughout, with a consistent emphasis on real-world applications. Bringing together world-renowned experts from industry and academia, this is an indispensable volume for researchers, engineers and systems designers in the wireless communication industry.

Mobile Edge Computing - Yan Zhang 2021-10-01

This is an open access book. It offers comprehensive, self-contained knowledge on Mobile Edge Computing (MEC), which is a very promising technology for achieving intelligence in the next-generation wireless communications and computing networks. The book starts with the basic concepts, key techniques and network architectures of MEC. Then, we present the wide applications of MEC, including edge caching, 6G networks, Internet of Vehicles, and UAVs. In the last part, we present new opportunities when MEC meets blockchain, Artificial Intelligence, and distributed machine learning (e.g., federated learning). We also identify the emerging applications of MEC in pandemic, industrial Internet of Things and disaster management. The book allows an easy cross-reference owing to the broad coverage on both the principle and applications of MEC. The book is written for people interested in communications and computer networks at all levels. The primary audience includes senior undergraduates, postgraduates, educators, scientists, researchers, developers, engineers, innovators and research strategists.

Towards 5G - Rath Vannithamby 2017-01-30

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

Ultra-dense Networks - Haijun Zhang 2020-07-31

Understand the theoretical principles, key technologies and applications of UDNs with this authoritative survey. Theory is explained in a clear, step-by-step manner, and recent advances and open research challenges in UDN physical layer design, resource allocation and network management are described, with examples, in the context of B5G and 6G standardization. Topics covered include NOMA-based physical layer design, physical layer security. Interference management, 3D base station deployment, software defined UDNs, wireless edge caching in UDNs, UDN-based UAVs and field trials and tests. A perfect resource for graduate students, researchers and professionals who need to get up to speed on the state of the art and future opportunities in UDNs.

Interference Alignment - Syed A. Jafar 2011

Interference Alignment: A New Look at Signal Dimensions in a Communication Network provides both a tutorial and a survey of the state-of-art on the topic.

Wireless Edge Caching - Thang X. Vu 2021-03-11

Discover the latest research results for both uncoded and coded caching techniques in future wireless network design.

OPNET IoT Simulation - Min Chen 2019-09-17

This is the first book offering an in-depth and comprehensive IoT network simulation, supported by OPNET tool. Furthermore, the book presents the simulations of IoT in general, not limited by OPNET. The authors provide rich OPNET IoT simulation codes, with detailed explanation regarding the functionalities of the model. These codes can facilitate readers' fast implementation, and the shared model can guide readers through developing their own research. This book addresses various versions of Internet of Things (IoT), including human-centric IoT, green IoT, Narrow band IoT, Smart IoT, IoT-Cloud integration. The introduced OPNET IoT simulation provides a comprehensive platform to simulate above-mentioned IoT systems. Besides, this book introduces OPNET semi-physical simulation in detail. Based on this technology, simulated IoT and practical cloud are seamlessly connected with each other. On top of this "IoT-cloud-integration" semi-physical simulation environment, various smart IoT applications can be realized.

Wireless Automation as an Enabler for the Next Industrial Revolution - Muhammad Ali Imran 2020-02-25

Presents the components, challenges, and solutions of wireless automation as enablers for industry 4.0 This timely book introduces the state of the art in industrial automation techniques, concentrating on wireless methods for a variety of applications, ranging from simple smart homes to heavy-duty complex industrial setting with robotics accessibility. It covers a wide range of topics including the industrial revolution enablers, applications, challenges, their possible solutions, and future directions. Wireless Automation as an Enabler for the Next Industrial Revolution opens with an introduction to wireless sensor networks and their applications in various domains, emphasizing industrial wireless networks and their future uses. It then takes a look at life-span extension for sensor networks in the industry, followed by a chapter on multiple access and resource sharing for low latency critical industrial networks. Industrial automation is covered next, as is the subject of ultra reliable low latency communications. Other topics include: self healing in wireless networks; cost efficiency optimization for industrial automation; a non event-based approach for non-intrusive load monitoring; wireless networked control; and caching at the edge in low latency wireless networks. The book finishes with a chapter on the application of terahertz sensing at nano-scale for precision agriculture. Introduces the future evolving dimension in industrial automation and discusses the enablers of the industrial revolution Places particular emphasis on wireless communication techniques which make industrial automation reliable, efficient, and cost-effective Covers many of the associated topics and concepts like robotics, AI, internet-of-things, telesurgery, and remote manufacturing Of great interest to researchers from academia and industry who are looking at the industrial development from various perspectives Wireless Automation as an Enabler for the Next Industrial Revolution is an excellent book for telecom engineers, IoT experts, and industry professionals. It would also greatly benefit researchers, professors, and doctorate and postgraduate students involved in automation and industry 4.0.

Dictionary of Information Technology - Ramesh Bangia 2010

Mobile Big Data - Xiang Cheng 2018-08-23

This book provides a comprehensive picture of mobile big data starting from data sources to mobile data driven applications. Mobile Big Data comprises two main components: an overview of mobile big data, and the case studies based on real-world data recently collected by one of the largest mobile network carriers in China. In the first component, four areas of mobile big data life cycle are surveyed: data source and collection, transmission, computing platform and applications. In the second component, two case studies are provided, based on the signaling data collected in the cellular core network in terms of subscriber privacy evaluation and demand forecasting for network management. These cases respectively give a vivid demonstration of what mobile big data looks like, and how it can be analyzed and mined to generate useful and meaningful information and knowledge. This book targets researchers, practitioners and

professors relevant to this field. Advanced-level students studying computer science and electrical engineering will also be interested in this book as supplemental reading.

[Game Theory for Next Generation Wireless and Communication Networks](#) - Zhu Han 2019-06-27

A unified treatment of the latest game theoretic approaches for designing, modeling, and optimizing emerging wireless communication networks. Covering theory, analytical tools, and applications, it is ideal for researchers and graduate students in academia and industry designing efficient, scalable and robust protocols for future wireless networks.

Next Generation Wireless Networks - Sirin Tekinay 2001

This book is an organized and edited work of enabling technologies for the applications and services needed for future wireless networks. Its focus is the defining architectures, services and applications, with coverage of all layers, i.e., from the physical layer to the information handling layers of the network. The new wireless network architectures are geared specifically for enabling mobility and location-enhanced applications. Presented first are tutorials on new network architectures, including a discussion of "infostations", the role of satellites in broadband wireless access, and the "infocity" concept. The next three chapters present material that describes the state-of-the-art in wireless geolocation systems (including "assisted GPS"), alternatives for wireless geolocation, and empirical data on wireless geolocation capabilities. The first of the last two chapters demonstrates the use of location information in next generation wireless networks, with coverage of real-time geolocation measurements in mobile connectivity. The final chapter portrays the creation of a "killer application" in wireless networks. Leading researchers in the field have contributed to this volume. Next Generation Wireless Networks is essential reading for engineers, researchers, application design specialists, and product managers in the field of wireless network architectures and wireless geolocation.

Web Services - ICWS 2020 - Wei-Shinn Ku 2020-09-18

This book constitutes the proceedings of the International Conference on Web of Services, ICWS 2020, held virtually as part of SCF 2020, in Honolulu, HI, USA, in September 2020. The 14 full papers presented in this volume were carefully reviewed and selected from 52 submissions. The conference proceeding ICWS 2020 presents the latest fundamental advances in the state of the art and practice of Web-based services, identify emerging research topics, and define the future of Web-based services. All topics regarding Web-centric services, enabling technologies and applications align with the theme of ICWS.

Network Slicing for 5G and Beyond Networks - S. M. Ahsan Kazmi 2019-05-14

This book provides a comprehensive guide to the emerging field of network slicing and its importance to bringing novel 5G applications into fruition. The authors discuss the current trends, novel enabling technologies, and current challenges imposed on the cellular networks. Resource management aspects of network slicing are also discussed by summarizing and comparing traditional game theoretic and optimization based solutions. Finally, the book presents some use cases of network slicing and applications for vertical industries. Topics include 5G deliverables, Radio Access Network (RAN) resources, and Core Network (CN) resources. Discusses the 5G network requirements and the challenges therein and how network slicing offers a solution. Features the enabling technologies of future networks and how network slicing will play a role. Presents the role of machine learning and data analytics for future cellular networks along with summarizing the machine learning approaches for 5G and beyond networks.

5G for Future Wireless Networks - Keping Long 2017-12-31

This book constitutes the proceedings of the First International Conference on 5G for Future Wireless Networks, 5GWN 2017, held in Beijing, China, in April 2017. The 64 full papers were selected from 135 submissions and present the state of the art and practical applications of 5G technologies. The exponentially growing data traffic caused by the development of mobile Internet and smart phones requires powerful networks. The fifth generation (5G) techniques are promising to meet the requirements of this explosive data traffic in future mobile communications.

Databases, Information Systems, and Peer-to-Peer

Computing - Gianluca Moro 2007-04-17

This book constitutes the thoroughly refereed postproceedings of the 3rd and 4th International Workshop on Databases, Information Systems and Peer-to-Peer Computing, DBISP2P 2005 and DBISP2P 2006, held in Trondheim, Norway, in August 2005 and in Seoul, Korea, in September 2006, as satellite events of VLDB, the International Conference on Very Large Data Bases.

Learning Representation and Control in Markov Decision Processes - Sridhar Mahadevan 2009

Provides a comprehensive survey of techniques to automatically construct basis functions or features for value function approximation in Markov decision processes and reinforcement learning.

5G for Future Wireless Networks - Victor C. M. Leung 2019-04-25

This book constitutes the proceedings of the Second International Conference on 5G for Future Wireless Networks, 5GWN 2019, held in Changsa, China, in February 2019. The 13 full papers were selected from 34 submissions and present the state of the art and practical applications of 5G technologies. The papers are arranged thematically on optimization theory and applications, intelligent computing technology for 5G applications, resource allocation and management, and security and privacy in emerging 5G applications.

Ultra-Dense Networks for 5G and Beyond - Trung Q. Duong 2019-04-15

Offers comprehensive insight into the theory, models, and techniques of ultra-dense networks and applications in 5G and other emerging wireless networks. The need for speed—and power—in wireless communications is growing exponentially. Data rates are projected to increase by a factor of ten every five years—and with the emerging Internet of Things (IoT) predicted to wirelessly connect trillions of devices across the globe, future mobile networks (5G) will grind to a halt unless more capacity is created. This book presents new research related to the theory and practice of all aspects of ultra-dense networks, covering recent advances in ultra-dense networks for 5G networks and beyond, including cognitive radio networks, massive multiple-input multiple-output (MIMO), device-to-device (D2D) communications, millimeter-wave communications, and energy harvesting communications. Clear and concise throughout, *Ultra-Dense Networks for 5G and Beyond - Modelling, Analysis, and Applications* offers a comprehensive coverage on such topics as network optimization; mobility, handoff control, and interference management; and load balancing schemes and energy saving techniques. It delves into the backhaul traffic aspects in ultra-dense networks and studies transceiver hardware impairments and power consumption models in ultra-dense networks. The book also examines new IoT, smart-grid, and smart-city applications, as well as novel modulation, coding, and waveform designs. One of the first books to focus solely on ultra-dense networks for 5G in a complete presentation. Covers advanced architectures, self-organizing protocols, resource allocation, user-base station association, synchronization, and signaling. Examines the current state of cell-free massive MIMO, distributed massive MIMO, and heterogeneous small cell architectures. Offers network measurements, implementations, and demos. Looks at wireless caching techniques, physical layer security, cognitive radio, energy harvesting, and D2D communications in ultra-dense networks. *Ultra-Dense Networks for 5G and Beyond - Modelling, Analysis, and Applications* is an ideal reference for those who want to design high-speed, high-capacity communications in advanced networks, and will appeal to postgraduate students, researchers, and engineers in the field.

[Kernel-based Reinforcement Learning](#) - Dirk Ormoneit 1999

Integrated Networking, Caching, and Computing - F. Richard Yu 2018-06-13

This book features the major research advances on integrated networking, caching, and computing. Information-centric networking-based caching is one of the promising techniques for future networks. The cloud computing paradigm has been widely adopted to enable convenient, on-demand network access to a shared pool of configurable computing resources. In addition, fog/edge computing is proposed to deploy computing resources

closer to end devices. From the perspective of applications, network, cache and compute are underlying enabling resources. How to manage, control and optimize these resources can have significant impacts on application performance.

Physical Layer Security - Khoa N. Le 2021-01-24

This book studies the vulnerability of wireless communications under line-of-sight (LoS) and non-LoS correlated fading environments. The authors theoretically and practically provide physical layer security analyses for several technologies and networks such as Fifth-Generation (5G) networks, Internet of

Things (IoT) applications, and Non-orthogonal multiple access (NOMA). The authors have provided these under various practical scenarios, and developed theoretical aspects to validate their proposed applications. Presents physical layer security (PLS) under correlated fading environments, 5G wireless networks, and NOMA networks; Provides end-to-end analyses, combination of channel correlation and outdated CSI and their effects on PL; Includes contributions of PLS research written by global experts in academia and industry.