Simulation Model For Lte Networks Using Opnet

Internet of Things, Smart Spaces, and Next Generation Networks and Systems
Testbeds and Research Infrastructures for the Development of Networks and Communications
Enabling Technologies and Architectures for Next-Generation Networking Capabilities
Wireless Network Simulation
Fuzzy System and Data Mining
LTE for 4G Mobile Broadband
Research Anthology on Developing and Optimizing 5G Networks and the Impact on Society
LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis
Heterogeneous Cellular Networks
Wired/Wireless Internet Communications
Analytical and Stochastic Modeling Techniques and Applications
Modeling and Simulation of Computer Networks and Systems
Networking Simulation for Intelligent Transportation Systems
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Broadband Communications, Networks, and Systems
Optimization and Performance Analysis of High Speed Mobile Access Networks
Comprehensive Energy Systems
Mobile Networks and Management
NETWORKING 2011 Workshops
Evolved Cellular Network Planning and Optimization for UMTS and LTE
Modeling and Dimensioning of Mobile Wireless Networks
The Vienna LTE-Advanced Simulators
Simulation and Modeling Methodologies, Technologies and Applications
Communication Technologies for Vehicles

Information Sciences and Systems 2014
Moving Broadband Mobile Communications Forward
Modeling the Power Consumption and Energy Efficiency of Telecommunications Networks
Advances in Communication Networking
Cooperative and Cognitive Satellite Systems
Recent Advances in Network Simulation
Handbook of Research on Next Generation Mobile Communication Systems
QoE Management in Wireless Networks
Simulation in Computer Network Design and Modeling: Use and Analysis
Modeling and Dimensioning of Mobile Wireless Networks
Modeling and Tools for Network Simulation
Water Resource Modeling and Computational Technologies
Multimedia Services and Applications in Mission Critical Communication Systems
Understanding LTE with MATLAB

TRAVIS DEANNA

Internet of Things, Smart Spaces, and Next Generation Networks and Systems John Wiley & Sons
Learn to run your own simulation by working with model analysis, mathematical background, simulation output data, and most importantly, a network simulator for wireless technology. This book introduces the best practices of simulator use, the techniques for analyzing simulations with artificial agents and the integration with other technologies such as Power Line Communications (PLC). Network simulation is a key technique used to test the future behavior of a network. It’s a vital development component for the development of 5G, IoT, wireless sensor networks, and many more. This book explains the scope and evolution of the technology that has led to the development of dynamic systems such as Internet of Things and fog computing. You'll focus on the ad hoc networks with stochastic behavior and dynamic nature, and the ns-3 simulator. These are useful open source tools for academics, researchers, students and engineers to deploy telecommunications experiments, proofs and new scenarios with a high degree of similarity with reality. You'll also benefit from a detailed explanation of the examples and the theoretical components needed to deploy wireless simulations or wired, if necessary. What You’ll Learn Review best practices of simulator uses Understand techniques for analyzing simulations with artificial agents Apply simulation techniques and

experiment design Program on ns-3 simulator Analyze simulation results Create new modules or protocols for wired and wireless networks Who This Book Is For Undergraduate and postgraduate students, researchers and professors interested in network simulations. This book also includes theoretical components about simulation, which are useful for those interested in discrete event simulation DES, general theory of simulation, wireless simulation and ns-3 simulator.

Testbeds and Research Infrastructures for the Development of Networks and Communications Springer Science & Business Media

Fuzzy logic is widely used in machine control. The term ‘fuzzy’ refers to the fact that the logic involved can deal with concepts that cannot be expressed as either ‘true’ or ‘false’, but rather as ‘partially true’. Fuzzy set theory is very suitable for modeling the uncertain duration in process simulation, as well as defining the fuzzy goals and fuzzy constraints of decision-making. It has many applications in industry, engineering and social sciences. This book presents the proceedings of the 2015 International Conference on Fuzzy Systems and Data Mining (FSDM2015), held in Shanghai, China, in December 2015. The application domain covers geography, biology, economics, medicine, the energy industry, social science, logistics, transport, industrial and production engineering, and computer science. The papers presented at the conference focus on topics such as system diagnosis, rule induction, process simulation/control, and decision-making. They include papers on solving practical problems with intelligent algorithms; statistical analysis; classification and clustering; and association rule learning. They also reflect the frontier in data mining research and address the challenges posed to data analytics research by the increasingly large datasets yielded by many application domains, together with new types of unstructured data. The book provides an overview of the ways in which fuzzy theory and data mining principles are applied in various fields, and will be of interest to all those who work in either the theory or practice of fuzzy systems and data mining.

Enabling Technologies and Architectures for Next-Generation Networking Capabilities IGI Global

This book introduces the technical foundations and tools for estimating the power consumption of internet networks and services, including a detailed description of how these models are constructed and applied. Modeling the Power Consumption and Energy Efficiency of Telecommunications Networks can be used to gain insight into the construction of mathematical models that provide realistic estimates of the power consumption of internet networks and services. This knowledge enables forecasting the energy footprint of future networks and services to integrate sustainability and environmental considerations into network planning and design. FEATURES Provides the motivation for developing mathematical models for telecommunications network and service power consumption and energy efficiency modeling Presents factors impacting overall network and service power consumption Discusses the types of network equipment and their power consumption profiles Reviews the basics of power modeling, including network segmentation, traffic forecasting, top-down and bottom-up models, wired and wireless networks, data centers and servers Explores the application of

energy efficiency metrics for equipment, networks, and services This book is aimed at students and technologists as well as technology managers and policy makers. This book will be of value to any organization that wishes to estimate the energy footprint of the use of information and communications technologies. This book can also be integrated into a course on the sustainability of information and communications technologies.

Wireless Network Simulation Springer Science & Business Media

Cooperative and Cognitive Satellite Systems provides a solid overview of the current research in the field of cooperative and cognitive satellite systems, helping users understand how to incorporate state-of-the-art communication techniques in innovative satellite network architectures to enable the next generation of satellite systems. The book is edited and written by top researchers and practitioners in the field, providing a comprehensive explanation of current research that allows users to discover future technologies and their applications, integrate satellite and terrestrial systems and services to create innovative network architectures, understand the requirements and possibilities for future satellite communications standards and protocols, and evaluate the feasibility and practical constraints involved in the deployment process. - Provides a solid overview of the current research in the field of co-operative and cognitive satellite systems - Presents concepts in multibeam and multicarrier joint processing and high performance random access schemes - Explains hybrid and dual satellite systems, cognitive broadband satellite systems, spectrum exploitation, and resource allocation

Fuzzy System and Data Mining Springer

The design and development of cost-effective mobile broadband wireless access networks is a key challenge for many mobile network operators. The over-dimensioning or under-dimensioning of an access network results in both additional costs and customer dissatisfaction. Thushara Weerawardane introduces new transport technologies and features for High Speed Packet Access (HSPA) and Long-Term Evolution (LTE) networks. Using advanced scientific methods, he proposes new adaptive flow control and enhanced congestion control algorithms, then defends them with highly-developed analytical models derived from Markov chains. For faster analysis, compared to long-lasting detailed simulations, these models provide optimum network performance and ensure reliable quality standards for end users during transport network congestion. Further, the author investigates and analyzes LTE transport network performance by introducing novel traffic differentiation models and buffer management techniques during intra-LTE handovers.

LTE for 4G Mobile Broadband John Wiley & Sons

Most books on network planning and optimization provide limited coverage of either GSM or WCDMA techniques. Few scrape the surface of HSPA, and even fewer deal with TD-SCDMA. Filling this void, Evolved Cellular Network Planning and Optimization for UMTS and LTE presents an accessible introduction to all stages of planning and optimizing UMTS, HSPA,

Research Anthology on Developing and Optimizing 5G Networks and the Impact on Society Springer Nature

The present book includes a set of selected extended papers

from the 4th International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH 2014), held in Vienna, Austria, from 28 to 30 August 2014. The conference brought together researchers, engineers and practitioners interested in methodologies and applications of modeling and simulation. New and innovative solutions are reported in this book. SIMULTECH 2014 received 167 submissions, from 45 countries, in all continents. After a double blind paper review performed by the Program Committee, 23% were accepted as full papers and thus selected for oral presentation. Additional papers were accepted as short papers and posters. A further selection was made after the Conference, based also on the assessment of presentation quality and audience interest, so that this book includes the extended and revised versions of the very best papers of SIMULTECH 2014. Commitment to high quality standards is a major concern of SIMULTECH that will be maintained in the next editions, considering not only the stringent paper acceptance ratios but also the quality of the program committee, keynote lectures, participation level and logistics.

LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis BoD – Books on Demand

This book constitutes the thoroughly refereed post-conference proceedings of the Second International ICST Conference on Mobile Networks and Management, MONAMI 2010, held in Santander, Spain in September 2010. The 29 revised full papers presented were carefully reviewed and selected for inclusion in the proceedings. The papers are organized in topical sections on routing and virtualization, autonomic networking, mobility management, multiaccess selection, wireless network management, wireless networks, and future research directions.

Heterogeneous Cellular Networks Springer

In emergency and disaster scenarios, it is vital to have a stable and effective infrastructure for relaying communication to the public. With the advent of new technologies, more options are available for enhancing communication systems. Multimedia Services and Applications in Mission Critical Communication Systems is a comprehensive source of academic research on the challenges and solutions in creating stable mission critical systems and examines methods to improve system architecture and resources. Highlighting innovative perspectives on topics such as quality of service, performance metrics, and intrusion detection, this book is ideally designed for practitioners, professionals, researchers, graduate students, and academics interested in public safety communication systems.

Wired/Wireless Internet Communications Morgan Kaufmann

Based on a rigorous selection of submissions to The 29th International Symposium on Computer and Information Sciences (ISCIS 2014), this books includes some of the most recent ideas and technical results in computer systems, computer science, and computer-communication networks. It offers the reader a timely access to innovative research and advances in computing and communications from many different areas of the world. The topics covered include (but are not limited to) computer architectures and digital systems, algorithms, theory, software engineering, data engineering, computational intelligence, system security, computer systems and networks, performance modeling and analysis, distributed and parallel systems,

bioinformatics, computer vision and significant applications such as medical informatics and imaging. The 29th International Symposium on Computer and Information Sciences (ISCIS 2014) took place in Krakow Old City, Poland on October, 27–8, 2014.

Analytical and Stochastic Modeling Techniques and Applications Wiley

Get to grips with the essential concepts and features of ns-3 using practical examples and assessments Purchase of the print or Kindle book includes a free PDF eBook Key Features Explore network simulation for development, testing, and evaluation activities Understand the key building blocks of simulation and evaluate network topologies Learn how to set up and evaluate wired, Wi-Fi (802.11a/b/g/n/ac/ax), and 4G LTE networks Book Description Network simulation is a powerful technique that uses software programs to replicate the behaviors of real networks. Network simulators are programs that can predict the performance of computer networks or wireless communication networks. This book is your hands-on guide to ns-3, a script-based simulator that allows for learning, experimenting, and evaluating wired, wireless (802.11a/b/g/n/ac/ax), and 4G long-term evolution (LTE) networks quickly and at low cost. You'll begin by learning how to install and use ns-3, along with exploring its key features such as building blocks for creating a variety of wired or wireless network topologies, installing suitable protocols and applications, identifying and resolving networking issues, and systematically evaluating network performance. As you make progress, you'll gain a clear understanding of simulation errors, exceptions, and abrupt events. You'll also discover how to set up and evaluate Ethernet, Wi-Fi (802.11n/ac/ax) LANs, ad-hoc, and LTE networks. The concluding chapters discuss LTE advanced topics such as capacity planning, site surveys, radio resources, mobility management, and interference handling. By the end of this simulation book, you'll be able to use ns-3 to implement, analyze, debug, and evaluate the performance of wired or wireless networks, as well as setting up custom test scenarios. What you will learn Get to grips with the installation of ns-3 for learning and research Explore ns-3 logging, debugging, tracing, and evaluation on networks Discover various wired, wireless, and ad hoc networks Understand the set-up using Wi-Fi protocols, placement, and mobility models Find out how to set up advanced Wi-Fi technologies such as 802.11n/ac/ax features Explore LTE basics, advanced network features, and research activities Who this book is for This book is primarily for network engineers, networking researchers, and undergraduates. Postgraduate students, researchers, and professors interested in network simulations will also find this book useful. A basic understanding of network simulation technology will be helpful in grasping the topics present in this book.

Modeling and Simulation of Computer Networks and Systems Springer

This book constitutes the refereed proceedings of the 19th EUNICE/IFIP WG 6.2, 6.6 workshop on Advances in Communication Networking, EUNICE 2013, held in Chemnitz, Germany, in August 2013. The 23 oral papers demonstrated together with 9 poster presentations were carefully reviewed and selected from 40 submissions. The papers are organized in topical sections on network modeling and design, traffic analysis, network and traffic management, services over mobile networks,

monitoring and measurement, security concepts, application of ICT in smart grid and smart home environments, data dissemination in ad-hoc and sensor networks, and services and applications.

Networking Simulation for Intelligent Transportation Systems IGI Global

An introduction to technical details related to the Physical Layer of the LTE standard with MATLAB® The LTE (Long Term Evolution) and LTE-Advanced are among the latest mobile communications standards, designed to realize the dream of a truly global, fast, all-IP-based, secure broadband mobile access technology. This book examines the Physical Layer (PHY) of the LTE standards by incorporating three conceptual elements: an overview of the theory behind key enabling technologies; a concise discussion regarding standard specifications; and the MATLAB® algorithms needed to simulate the standard. The use of MATLAB®, a widely used technical computing language, is one of the distinguishing features of this book. Through a series of MATLAB® programs, the author explores each of the enabling technologies, pedagogically synthesizes an LTE PHY system model, and evaluates system performance at each stage. Following this step-by-step process, readers will achieve deeper understanding of LTE concepts and specifications through simulations. Key Features: • Accessible, intuitive, and progressive; one of the few books to focus primarily on the modeling, simulation, and implementation of the LTE PHY standard • Includes case studies and testbenches in MATLAB®, which build knowledge gradually and incrementally until a functional specification for the LTE PHY is attained • Accompanying Web site includes all MATLAB® programs, together with PowerPoint slides and other illustrative examples Dr Houman Zarrinkoub has served as a development manager and now as a senior product manager with MathWorks, based in Massachusetts, USA. Within his 12 years at MathWorks, he has been responsible for multiple signal processing and communications software tools. Prior to MathWorks, he was a research scientist in the Wireless Group at Nortel Networks, where he contributed to multiple standardization projects for 3G mobile technologies. He has been awarded multiple patents on topics related to computer simulations. He holds a BSc degree in Electrical Engineering from McGill University and MSc and PhD degrees in Telecommunications from the Institut Nationale de la Recherche Scientifique, in Canada. www.wiley.com/go/zarrinkoub

Advanced Network Simulations Simplified IGI Global

This book is a must-read for all network planners and other professionals wishing to improve the quality and cost efficiency of 3G and LTE networks In this book, the authors address the architecture of the 2/3G network and the Long Term Evolution (LTE) network. The book proposes analytical models that make the analysis and dimensioning of the most important interfaces, i.e. WCDMA or Iub, possible. Furthermore, the authors include descriptions of fundamental technological issues in 2/3 G networks, basic traffic engineering models and frequent examples of the application of analytical models in the analysis and dimensioning of the interface of cellular networks. The specific knowledge included in the content will enable the reader to understand and then to prepare appropriate programming softwares that will allow them to evaluate quality parameters of

cellular networks, i.e. blocking probabilities or call losses. Additionally, the book presents models for the analysis and dimensioning of the Wideband Code Division Multiple Access (WCDMA) radio interface and the Iub interface, both carrying a mixture of Release 99 traffic (R99) and High-Speed Packet Access (HSPA) traffic streams. Finally, the analytical models presented in the book can be also used in the process of modeling and optimization of LTE networks. Key Features: Describes the architecture and the modes of operation of the cellular 2/3/4G systems and the LTE network Covers the traffic theory and engineering within the context of mobile networks Presents original analytical methods that enable their users to dimension selected interfaces of cellular networks Discusses models for the analysis and dimensioning of the Wideband Code Division Multiple Access (WCDMA) radio interface and the Iub interface, both carrying a mixture of Release 99 traffic (R99) and High-Speed Packet Access (HSPA) traffic streams Includes problems as well as an accompanying website containing solutions, software tools and interactive flash animations (http://wiley.teletraffic.pl) This book will be an invaluable guide for professional engineers (radio planning engineers, optimization engineers, transmission engineers, core network engineers, Service Management engineers) working in the areas of mobile wireless networks technology, not only in optimization process, but also in profitability assessment of newly implemented services (i.e. in NPV - Net Present Value analysis), and researchers and scientists. Advanced students in the fields of mobile communications networks and systems will also find this book insightful.

Networking Simulation for Intelligent Transportation Systems CRC Press

This book constitutes the refereed proceedings of the 20th International Conference on Analytical and Stochastic Modelling and Applications, ASMTA 2013, held in Ghent, Belgium, in July 2013. The 32 papers presented were carefully reviewed and selected from numerous submissions. The focus of the papers is on the following application topics: complex systems; computer and information systems; communication systems and networks; wireless and mobile systems and networks; peer-to-peer application and services; embedded systems and sensor networks; workload modelling and characterization; road traffic and transportation; social networks; measurements and hybrid techniques; modeling of virtualization; energy-aware optimization; stochastic modeling for systems biology; biologically inspired network design.

Multi-Carrier Systems & Solutions 2009 John Wiley & Sons

A crucial step during the design and engineering of communication systems is the estimation of their performance and behavior; especially for mathematically complex or highly dynamic systems network simulation is particularly useful. This book focuses on tools, modeling principles and state-of-the art models for discrete-event based network simulations, the standard method applied today in academia and industry for performance evaluation of new network designs and architectures. The focus of the tools part is on two distinct simulations engines: OmNet++ and ns-3, while it also deals with issues like parallelization, software integration and hardware simulations. The parts dealing with modeling and models for network simulations are split into a wireless section and a section

dealing with higher layers. The wireless section covers all essential modeling principles for dealing with physical layer, link layer and wireless channel behavior. In addition, detailed models for prominent wireless systems like IEEE 802.11 and IEEE 802.16 are presented. In the part on higher layers, classical modeling approaches for the network layer, the transport layer and the application layer are presented in addition to modeling approaches for peer-to-peer networks and topologies of networks. The modeling parts are accompanied with catalogues of model implementations for a large set of different simulation engines. The book is aimed at master students and PhD students of computer science and electrical engineering as well as at researchers and practitioners from academia and industry that are dealing with network simulation at any layer of the protocol stack.

Broadband Communications, Networks, and Systems Elsevier

The deployment of 4G/LTE (Long-Term Evolution) mobile networks has solved the major challenge of high capacities to build a real broadband mobile internet. This was possible mainly through a very strong physical layer and flexible network architecture. However, bandwidth-hungry services such as virtual reality (VR) and augmented reality (AR), have been developed in an unprecedented way. Furthermore, mobile networks are facing other new services with extreme demand for greater reliability and almost zero-latency performance, like vehicle communications and the Internet of Vehicles (IoV). Therefore, industries and researchers are investigating new physical layers and softwarization techniques and including more intelligence in 5G and beyond 5G (B5G/6G). This book discusses some of these softwarization techniques, such as fog computing, cloud computing, and artificial intelligence (AI) and machine learning (ML). It also presents use cases showing practical aspects from 5G deployment scenarios, where other communications technologies will co-habit to build the landscape of next-generation mobile networks (NGMNs).

Optimization and Performance Analysis of High Speed Mobile Access Networks Academic Press

This book constitutes the joint refereed proceedings of the 15th International Conference on Next Generation Wired/Wireless Advanced Networks and Systems, NEW2AN 2015, and the 8th Conference on Internet of Things and Smart Spaces, ruSMART 2015, held in St. Petersburg, Russia, in August 2015. The 74 revised full papers were carefully reviewed and selected from numerous submissions. The 15 papers selected for ruSMART are organized in topical sections on IoT infrastructure, IoT platforms, smart spaces and IoT cases, and smart services and solutions. The 59 papers from NEW2AN deal with the following topics: streaming, video, and TCP applications, mobile "ad hoc" networks, security, and clouds, sensor networks and IoT, cellular systems, novel systems and techniques, business and services, signals and circuits, optical and satellite systems, and advanced materials and their properties.

Comprehensive Energy Systems Springer

A technological overview of LTE and WiMAX LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis provides a practical guide to LTE and WiMAX technologies introducing various tools and concepts used within. In addition,

topics such as traffic modelling of IP-centric networks, RF propagation, fading, mobility, and indoor coverage are explored; new techniques which increase throughput such as MIMO and AAS technology are highlighted; and simulation, network design and performance analysis are also examined. Finally, in the latter part of the book Korowajczuk gives a step-by-step guide to network design, providing readers with the capability to build reliable and robust data networks. By focusing on LTE and WiMAX this book extends current network planning approaches to next generation wireless systems based on OFDMA, providing an essential resource for engineers and operators of fixed and wireless broadband data access networks. With information presented in a sequential format, LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis aids a progressive development of knowledge, complementing latter graduate and postgraduate courses while also providing a valuable resource to network designers, equipment vendors, reference material, operators, consultants, and regulators. Key Features: One of the first books to comprehensively explain and evaluate LTE Provides an unique explanation of the basic concepts involved in wireless broadband technologies and their applications in LTE, WiMAX, and WLAN before progressing to the network design Demonstrates the application of network planning for LTE and WiMAX with theoretical and practical approaches Includes all aspects of system design and optimization, such as dynamic traffic simulations, multi-layered traffic analysis, statistical interference analysis, and performance estimations

Mobile Networks and Management Packt Publishing Ltd

This SpringerBrief presents research results on QoE management schemes for mobile services, including user services, and resource allocation. Along with a review of the research literature, it offers a data-driven architecture for personalized QoE management in wireless networks. The primary focus is on introducing efficient personalized character extraction mechanisms, e.g., context-aware Bayesian graph model, and cooperative QoE management mechanisms. Moreover, in order to demonstrate in the effectiveness of the QoE model, a QoE measurement platform is described and its collected data examined. The brief concludes with a discussion of future research directions. The example mechanisms and the data-driven architecture provide useful insights into the designs of QoE management, and motivate a new line of thinking for users' satisfaction in future wireless networks.