Vehicular Communications And Networks Architectures Protocols Operation And Deployment Woodhead Publishing Series In Electronic And Optical Materials

A Trust-driven Privacy Architecture for Vehicular Ad-hoc Networks

Intelligent Vehicular Networks and Communications

Emerging Wireless Communication and Network Technologies

Vehicular Networks

Bio-inspired Routing Protocols for Vehicular Ad-Hoc Networks

Information Security of Intelligent Vehicles Communication

Vehicular Cloud Computing for Traffic Management and Systems

Vehicle-To-Vehicle and Vehicle-To-Infrastructure Communications

Blockchain-enabled Fog and Edge Computing: Concepts, Architectures and Applications

Wireless Device-to-Device Communications and Networks

Interference in Vehicle-to-vehicle Communication Networks

Wireless Networks and Industrial IoT

Green Computing in Network Security

Vehicular Communications for Smart Cars

SG-Enabled Vehicular Communications and Networking

Advances in Delay-Tolerant Networks (DTNs)

Rail Vehicle Mechatronics

Quality of Service Architectures for Wireless Networks: Performance Metrics and Management

Communication Technologies for Vehicles

Vehicular Networking

Vehicular-2-X Communication

Telematics Communication Technologies and Vehicular Networks: Wireless Technologies and Applications

Vehicular Technologies

Characterization, Avoidance and Repair of Packet Collisions in Inter-Vehicle Communication Networks

Research Anthology on Architectures, Frameworks, and Integration Strategies for Distributed and Cloud Computing

Roadside Networks for Vehicular Communications: Architectures, Applications, and Test Fields

Vehicular-2-X Communication in Europe and MENA Cooperation

Advances in Information and Communication Technologies

Vehicular Communications and Networks

Capacity Analysis of Vehicular Communication Networks

During the last 15 years, the interest in vehicular communication has grown, especially in the automotive industry. Due to the envisioned mass market, projects focusing on Car-to-X communication experience high public visibility. This book presents vehicular communication in a broader perspective that includes more than just its application to the automotive industry. It provides, researchers, engineers, decision makers and graduate students in wireless communications with an introduction to vehicular communication focusing on car-to-x and train-based systems. Emphasizes important perspectives of vehicular communication including market area, application areas, and standardization issues as well as selected topics featuring aspects of developing, prototyping, and testing vehicular communication systems. Supports the reader in understanding common characteristics and differences between the various application areas of vehicular communication. Offers both an overview of the application area and an in-depth discussion of key technologies in these areas. Written by a wide range of experts in the field. Universal vehicular communication promises many improvements in terms of accident avoidance and mitigation, better utilization of roads and resources such as time and fuel, and new opportunities for infotainment applications. However, before widespread acceptance, vehicular communication must meet challenges comparable to the trouble and disbelief that accompanied the introduction of traffic lights back then. The rst traf c light was installed in 1868 in London to signal railway, but only later, in 1912, was invented the rst red-green electric traffic light. And roughly 50 years after the rst traf c light, in 1920, the rst four-way traf c signal comparable to our today’s traf c lights was introduced. The introduction of traf c signals was necessary after automobiles soon became prevalent once the rst car in history, actually a wooden motorcycle, was constructed in 1885. Soon, the scene became complicated, requiring the introduction of the “right-of-way” philosophy and later on the very rst traf c light. In the same way the traf c light was a necessary mean to regulate the beginning of the automotive life and to protect drivers, passengers, as well as pedestrians and other inhabitants of the road infrastructure, vehicular communication is necessary to accommodate the further growth of traf c volume and to signi cantly reduce the number of accidents. This is the second volume of proceedings including selected papers from the International Conference on IT Convergence and Security (ICITCS) 2017, presenting a snapshot of the latest issues encountered in the field. It explores how IT convergence and security issues are core to most current research, industrial and commercial activities and consists of contributions covering topics including machine learning & deep learning, communication and signal processing, computer vision and applications, future network technology, artificial intelligence and robotics. ICITCS 2017 is the latest in a series of highly successful...
The first traffic light was installed in 1868 in London to signal railway, but only later, in 1912, was invented the first red-green electric traffic light. And roughly 50 years after the first traffic light, in 1920, the first four-way traffic signal comparable to our today's traffic lights was introduced. The introduction of traffic signals was necessary after automobiles soon became prevalent once the first cars in history, actually a wooden motorcycle, was constructed in 1885. Soon, the scene became complicated, requiring the introduction of the “right-of-way” philosophy and later on the very first traffic light. In the same way the traffic light was a necessary mean to regulate the beginning of the automotive life and to protect drivers, passengers, as well as pedestrians and other inhabitants of the road infrastructure, vehicular communication is necessary to accommodate the further growth of traffic volume and to significantly reduce the number of accidents. This book presents vehicular ad-hoc networks (VANETs) from their onset, gradually going into technical details, providing a clear understanding of both theoretical foundations and more practical investigation. The editors gathered top-ranking authors to provide comprehensiveness and timely content; the invited authors were carefully selected from a list of who’s who in the respective field of interest: there are as many from Academia as from Standardization and Industry sectors from around the world. The covered topics are organized around five Parts starting from an historical overview of vehicular communications and standardization/harmonization activities (Part I), then progressing to the theoretical foundations of VANETs and a description of the day-one standard-compliant solutions (Part II), hence going into details of vehicular networking and security (Part III) and to the tools to study VANETs, from mobility and channel models, to network simulators and field trial methodologies (Part IV), and finally looking into the future of VANETs by investigating alternative, complementary communication technologies, innovative networking paradigms and visionary applications (Part V). The way the content is organized, with a differentiated level of technical details, makes the book a valuable reference for a large pool of target readers ranging from undergraduate, graduate and PhD students, to wireless scientists and engineers, to service providers and stakeholders in the automotive, ITS, ICT sectors.Intelligent Vehicular Network and Communications: Fundamentals, Architectures and Solutions begins with discussions on how the transportation system has transformed into today's Intelligent Transportation System (ITS). It explores the design goals, challenges, and frameworks for modeling an ITS network, discussing vehicular network model technologies, mobility management architectures, and routing mechanisms and protocols. It looks at the Internet of Vehicles, the vehicular cloud, and vehicular network security and privacy issues. The book investigates cooperative vehicular systems, a promising solution for addressing current and future traffic safety needs, also exploring cooperative cognitive intelligence, with special attention to spectral efficiency, spectral scarcity, and high mobility. In addition, users will find a thorough examination of experimental work in such areas as Controller Area Network protocol and working function of On Board Unit, as well as working principles of roadside unit and other infrastructural nodes. Finally, the book examines big data in vehicular networks, exploring various business models, application scenarios, and real-time analytics, concluding with a look at autonomous vehicles. Proposes cooperative, cognitive, intelligent vehicular networks Examines how intelligent transportation systems make more efficient transportation in urban environments Outlines next generation vehicular networks technologyUniversal vehicular communication promises many improvements in terms of accident avoidance and mitigation, better utilization of roads and resources such as time and fuel, and new opportunities for infotainment applications. However, before widespread acceptance, vehicular communication must meet challenges comparable to the trouble and disbelief that accompanied the introduction of traffic lights back then. The first traffic light was installed in 1868 in London to signal railway, but only later, in 1912, was invented the first red-green electric traffic light. And roughly 50 years after the first traffic light, in 1920, the first four-way traffic signal comparable to our today's traffic lights was introduced. The introduction of traffic signals was necessary after automobiles soon became prevalent once the first car in history, actually a wooden motorcycle, was constructed in 1885. Soon, the scene became complicated, requiring the introduction of the “right-of-way” philosophy and later on the very first traffic light. In the same way the traffic light was a necessary mean to regulate the beginning of the automotive life and to protect drivers, passengers, as well as pedestrians and other inhabitants of the road infrastructure, vehicular communication is necessary to accommodate the further growth of traffic volume and to significantly reduce the number of accidents. This book constitutes the proceedings of the 14th International Workshop on Communication Technologies for Vehicles, Nets4Cars/Nets4Trains/Nets4Aircraft 2019, held in Colmar, France, in May 2019. The 9 full papers and 1 short paper in this volume were carefully reviewed and selected from 15 submissions. The volume features contributions in the theory or practice of intelligent transportation systems (ITS) and communication technologies for: - Vehicles on the road: e.g. cars, trucks and buses; - Air: e.g. aircraft and unmanned aerial vehicles; and - Rail: e.g. trains, metros and trams. In recent years, the Medical Internet of Things (MIoT) has emerged as one of the most helpful technological gifts to mankind. With the incredible development in data science, big data technologies, IoT and embedded systems, it is now possible to collect a huge amount of sensitive and personal data, compile it and store it through cloud or edge computing techniques. However, important concerns remain about security and privacy, the preservation of sensitive and personal data, and the efficient transfer, storage and processing of MIoT-based data. Medical Internet of Things: Techniques, Practices and Applications is an attempt to explore new ideas and novel techniques in the area of MIoT. The book is composed of fifteen chapters discussing basic concepts, issues, challenges, case studies and applications in MIoT. This book offers novel advances and applications of MIoT in a precise
and clear manner to the research community to achieve in-depth knowledge in the field. This book will help those interested in the field as well as researchers to gain insight into different concepts and their importance in multifaceted applications of real life. This has been done to make the book more flexible and to stimulate further interest in the topic. Features: A systematic overview of concepts in Medical Internet of Things (MIoT) is included. Recent research and some pointers on future advancements in MIoT are discussed. Examples and case studies are included. It is written in an easy-to-understand style with the help of numerous figures and datasets. This book serves as a reference book for scientific investigators who are interested in working on MIoT, as well as researchers developing methodology in this field. It may also be used as a textbook for postgraduate-level courses in computer science or information technology."This book attempts to close the gap between science and technology in the field of roadside backbones for VCNs"--Provided by publisher. The PC revolution, the advent of PDAs, and growth in the use of wireless LANs have changed the way we live our lives. Next on the horizon is the application of new technologies that will change the way we drive our cars. De rigueur for many drivers, electronic passes and GPS systems represent the tip of the iceberg in terms of emerging applications. This book investigates and reviews recent advanced techniques and important applications in vehicular communications and networking (VCN) from a novel perspective of the combination and integration of VCN and connected vehicles, which provides a significant scientific and technical support for future 5G-based VCN. 5G-Enabled Vehicular Communications and Networking introduces vehicular channel characteristics, reviews current channel modeling approaches, and then provides a new generic geometry-based stochastic modeling approach for vehicle-to-everything (V2X) communications. The investigation of vehicular channel measurements and modeling provides fundamental supports for the VCN system design. Then, this book investigates VCN-vehicle combination from PHY and MAC layers, respectively. As for the PHY layer, many advanced techniques that can be effectively applied in VCN to counter the PHY challenges are introduced, including novel ICI cancellation methods, index modulated OFDM, differential spatial modulation, and energy harvesting relaying. As for the MAC layer, distributed and centralized MAC designs are analyzed and compared in terms of feasibility and availability. Specifically, distributed congestion control, D2D-enabled vehicular communications, and centralized data dissemination scheduling are elaborated, which can significantly improve the network performance in vehicular networks. Finally, considering VCN-vehicle integration, this book introduces several hot-topics in vehicular networks, including electric vehicles, distributed data storage, unmanned aerial vehicles, and security and privacy, which indicates the significance and development value of VCN-vehicle integration in future vehicular networks and our daily life. The primary audience for this book includes professionals and researchers working in the field of vehicular communications, intelligent transportation systems (ITS), and Internet of vehicles (IoV). Advanced level students studying electrical engineering will also find this book useful as a secondary textbook for related courses. This book provides an insight for students, researchers and practitioners on the area of vehicular communications explaining and presenting solutions for some of the most critical issues in this field and, hopefully, inspiring new research directions. The book is organized in sections, which respond to different layers and aspects of the vehicular technology: infrastructures, cells deployment and its integration with the V2V part, access procedures, advanced services and applications as localization, spectrum sensing, relay-based cooperative networks. This unique and up-to-date work surveys the use of mechatronics in rail vehicles, notably traction, braking, communications, data sharing, and control. The results include improved safety, comfort, and fuel efficiency. Mechatronic systems are a key element in modern rail vehicle design and operation. Starting with an overview of mechatronic theory, the book goes on to cover topics including modeling of mechanical and electrical systems for rail vehicles, open and closed loop control systems, sensors, actuators and microprocessors. Modern simulation techniques and examples are included throughout, and numerical experiments and developed models for railway application are presented and explained. Case studies are used, alongside practical examples, to ensure that the reader can apply mechatronic theory to real world conditions. These case studies include modeling of a hybrid locomotive and simplified models of railway vehicle lateral dynamics for suspension control studies. Rail Vehicle Mechatronics provides current and in-depth content for design engineers, operations managers, systems engineers and technical consultants world-wide, working with freight, passenger, and urban transit railway systems. This SpringerBrief focuses on the network capacity analysis of VANETs, a key topic as fundamental guidance on design and deployment of VANETs is very limited. Moreover, unique characteristics of VANETs impose distinguished challenges on such an investigation. This SpringerBrief first introduces capacity scaling laws for wireless networks and briefly reviews the prior arts in deriving the capacity of VANETs. It then studies the unicast capacity considering the socialized mobility model of VANETs. With vehicles communicating based on a two-hop relaying scheme, the unicast capacity bound is derived and can be applied to predict the throughput of real-world scenarios of VANETs. The downlink capacity of VANETs is also investigated in which access...
infrastructure is deployed to provide pervasive Internet access to vehicles. Different alternatives of wireless access infrastructure are considered. A lower bound of downlink capacity is derived for each type of access infrastructure. The last section of this book presents a case study based on a perfect city grid to examine the capacity-cost trade-offs of different deployments since the deployment costs of different access infrastructure are highly variable.

This book contains a selection of articles from The Europe, Middle East and North Africa Conference on Technology and Security to Support Learning 2016 (EMENA-TSSL'16), held between the 3th and 5th of October at Saidia, Oujda, Morocco. EMENA-TSSL'16 is a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences and challenges in Information & Communication Technologies, and Security to support Learning. The main topics covered are: A) Online Education; B) Emerging Technologies in Education; C) Artificial Intelligence in Education; D) Gamification and Serious games; E) Network & Web Technologies Applications; F) Online experimentation and Virtual Laboratories; G) Multimedia Systems and Applications; H) Security and Privacy; I) Multimedia, Computer Vision and Image Processing; J) Cloud, Big Data Analytics and Applications; K) Human-Computer Interaction; L) Software Systems, Architectures, Applications and Tools; M) Online Languages and Natural Language Processing N) E-content Development, Assessment and Plagiarism; O) Secure E-Learning Development and Auditing; P) Internet of Things and Wireless Sensor Networks.

This book presents cutting-edge work on the most challenging research issues concerning intelligent transportation systems (ITS), introducing selected, highly relevant advanced research and scheduling on real-time communication for vehicular networks, as well as fault tolerance, test beds and simulations for ITS. The authors define new architectures that support cooperative sensing in ITS and offer guidance for the development of a reference end-to-end implementation. The presented results allow advanced traffic and travel management strategies to be formulated on the basis of reliable and real-time input data. The effectiveness of these new strategies, together with the proposed systems, is assessed in field trials and via simulations. The chapters in this book detail new research findings, algorithms, protocols, and the development of an implementation platform for ITS that merges and integrates heterogeneous data sources into a common system. In addition, they provide a set of advanced tools for the control, monitoring, simulation, and prediction of traffic that result in safer, more sustainable, and less congested roads. Work undertaken within the framework of the FP7 project ICSI (Intelligent Cooperative Sensing for Improved traffic efficiency) is also included in the research activities addressed.

Vehicular Ad-Hoc Networks (VANETs) are an emerging technology which aims to improve road safety by preventing and reducing traffic accidents. While VANETs offer a great variety of promising applications, such as, safety-related and infotainment applications, they remain a number of security and privacy related research challenges that must be addressed. A common approach to security issues widely adopted in VANETs is the use of Public Key Infrastructures (PKI) and digital certificates in order to enable authentication, authorization and confidentiality. These approaches usually rely on a large set of regional Certification Authorities (CAs). Despite the advantages of PKI-based approaches, there are two main problems that arise, i) the secure interoperability among the different and usually unknown-issuing CAs, and ii) the sole use of PKI in a VANET environment cannot prevent privacy related attacks, such as, linking a vehicle with an identifier, tracking vehicles "big brother scenario" and user profiling. Additionally, since vehicles in VANETs will be able to store great amounts of information including private information, unauthorized access to such information should be carefully considered. This thesis addresses authentication and interoperability issues in vehicular communications, considering an inter-regional scenario where mutual authentication between nodes is needed. To provide interoperability between vehicles and services among different domains, an Inter-domain Authentication System (AS) is proposed. The AS supplies vehicles with a trusted set of authentication credentials by implementing a near real-time certificate status service. The proposed AS also implements a mechanism to quantitatively evaluate the trust level of a CA, in order to decide on-the-y if an interoperability relationship can be created. This research work also contributes with a Privacy Enhancing Model (PEM) to deal with important privacy issues in VANETs. The PEM consists of two PKI-based privacy protocols: i) the Attribute-Based Privacy (ABP) protocol, and ii) the Anonymous Information Retrieval (AIR) protocol. The ABP introduces Attribute-Based Credentials (ABC) to provide conditional anonymity and minimal information disclosure, which overcome with the privacy issues relative to linkability (linking a vehicle with an identifier) and vehicle tracking (big brother scenario). The AIR protocol addresses user profiling when querying Service Providers (SPs), by relying in a user collaboration privacy protocol based on query forgery and permutation; and assuming that neither participant nodes nor SPs could be completely trusted. Finally, the Trust Validation Model (TVM) is proposed. The TVM supports decision making by evaluating entities trust based on context information, in order to provide i) access control to driver and vehicle's private information, and ii) public information trust validation. "This multiple-volume publications exhibits the most up-to-date collection of research results and recent discoveries in the transfer of...
knowledge access across the globe"—Provided by publisher. "This book examines critical issues involved with telematics such as vehicular network infrastructure, vehicular network communication protocols, and vehicular services and applications"—Provided by publisher. The book covers a wide range of wireless communication and network technologies, and will help readers understand the role of wireless technologies in applications touching on various spheres of human life, e.g. healthcare, agriculture, building smart cities, forecasting and the manufacturing industry. The book begins by discussing advances in wireless communication, including emerging trends and research directions for network technologies. It also highlights the importance of and need to actively develop these technologies. In turn, the book addresses different algorithms and methodologies which could be beneficial in implementing 5G Mobile Communication, Vehicular Ad-hoc Networks (VANET), Reliable Cooperative Networks, Delay Tolerant Networks (DTN) and many more contexts related to advanced communications. It then addresses the prominence of wireless communication in connection with the Internet of Things (IoT), Mobile Opportunistic Networks and Cognitive Radio Networks (CRN). Lastly, it presents the new horizons in architecture and building protocols for Li-Fi (Light-Fidelity) and Wearable Sensor Technology. This book provides a comprehensive overview of the most relevant research and standardization results in the area of wireless networking for Industrial IoT, covering both critical and massive connectivity. Most chapters in this book are intended to serve as short tutorials of particular topics, highlighting the main developments and ideas, as well as giving an outlook of the upcoming research challenges. The book is divided into four parts. The first part focuses on challenges, enablers and standardization efforts for reliable low-latency communication in Industrial IoT networks. The next part focuses on massive IoT, which requires cost- and energy-efficient technology components to efficiently connect a massive number of low-cost IoT devices. The third part covers three enabling technologies in the context of Industrial IoT: Security, Machine Learning/Artificial Intelligence and Edge Computing. These enablers are applicable to both connectivity types, critical and massive IoT. The last part covers aspects of Industrial IoT related to connected transportation that are important in, for example, warehouse and port logistics, product delivery and transportation among industries. Presents a comprehensive guide to concepts and research challenges in wireless networking for Industrial IoT; Includes an introduction and overview of such topics as 3GPP standardization for Industrial IoT, Time Sensitive Networking, system dependability over wireless networks, energy-efficient wireless networks, IoT security, ML/AI for Industrial IoT and connected transportation systems; Features contributions by well-recognized experts from both academia and industry. This book covers a wide range of topics from the smart transportation domain. It discusses protocols, applications and security concerns in various vehicular networks using examples and easy-to-understand figures. The first four chapters focus on vehicular network protocols and applications, while the remaining four chapters incorporate security, trust and privacy issues with examples from real-life cases. The book concludes with a vision of what to expect in the near future and will be an invaluable resource for anybody interested in this nascent technology and its variegated applications. Dr. Niaz Chowdhury is a postdoctoral research associate at the Knowledge Media Institute, the Open University in England. Dr. Lewis M. Mackenzie is a senior lecturer in computing science at the University of Glasgow, Vehicular Communications and Networks: Architectures, Protocols, Operation and Deployment discusses VANETs (Vehicular Ad-hoc Networks) or VCS (Vehicular Communication Systems), which can improve safety, decrease fuel consumption, and increase the capacity of existing roadways and which is critical for the Intelligent Transportation System (ITS) industry. Part one covers architectures for VCS, part two describes the physical layer, antenna technologies and propagation models, part three explores protocols, algorithms, routing and information dissemination, and part four looks at the operation and deployment of vehicular communications and networks. Comprehensive coverage of the fundamental principles behind Vehicular Ad-hoc Networks (VANETS) and the rapidly growing need for their further development Thorough overview of the design and development of key technologies and devices Explores the practical application of this technology by outlining a number of case studies, testbeds and simulations employing vehicular communications and networks Covering the fundamental theory together with the state of the art in research and development, this practical guide provides the techniques needed to design, analyze, and optimize device-to-device (D2D) communications in wireless networking. With an ever-increasing demand for higher data rate wireless access, D2D communication is set to become a key feature supported by next generation cellular networks. This book introduces D2D-based wireless communications from the physical, MAC, network, and application layer perspectives, providing all the key background information before moving on to discuss real-world applications as well as potential future developments. Key topics are discussed in detail, such as dynamic resource sharing (for example of spectrum and power) between cellular and ad hoc D2D communications to accommodate larger volumes of traffic and provide better service to users. Readers will understand the practical challenges of resource management, optimization, security, standardization, and network topology, and learn how the design principles are applied in practice. CLOUD AND IOT-BASED VEHICULAR AD HOC NETWORKS This book
details the architecture behind smart cars being fitted and connected with vehicular cloud computing, IoT and VANET as part of the
intelligent transport system (ITS). As technology continues to weave itself more tightly into everyday life, socioeconomic development has
become intricately tied to ever-evolving innovations. An example of this is the technology being developed to address the massive increase
in the number of vehicles on the road, which has resulted in more traffic congestion and road accidents. This challenge is being addressed
by developing new technologies to optimize traffic management operations. This book describes the state-of-the-art of the recent
developments of Internet of Things (IoT) and cloud computing-based concepts that have been introduced to improve Vehicular Ad-Hoc Networks
(VANET) with advanced cellular networks such as 5G networks and vehicular cloud concepts. 5G cellular networks provide consistent, faster
and more reliable connections within the vehicular mobile nodes. By 2030, 5G networks will deliver the virtual reality content in VANET
which will support vehicle navigation with real time communications capabilities, improving road safety and enhanced passenger comfort. In
particular, the reader will learn: A range of new concepts in VANETs, integration with cloud computing and IoT, emerging wireless
networking and computing models New VANET architecture, technology gap, business opportunities, future applications, worldwide
applicability, challenges and drawbacks Details of the significance of 5G Networks in VANET, vehicular cloud computing, edge (fog)
computing based on VANET. Audience The book will be widely used by researchers, automotive industry engineers, technology developers,
system architects, IT specialists, policymakers and students. Advances in Delay-Tolerant Networks: Architecture and Enhanced Performance,
Second Edition provides an important overview of delay-tolerant networks (DTNs) for researchers in electronics, computer engineering,
telecommunications and networking for those in academia and R&D in industrial sectors. Part I reviews the technology involved and the
prospects for improving performance, including different types of DTN and their applications, such as satellite and deep-space
communications and vehicular communications. Part II focuses on how the technology can be further improved, addressing topics, such as
data bundling, opportunistic routing, reliable data streaming, and the potential for rapid selection and dissemination of urgent messages.
Opportunistic, delay-tolerant networks address the problem of intermittent connectivity in a network where there are long delays between
sending and receiving messages, or there are periods of disconnection. Reviews the different types of DTN and shows how they can be
applied in satellite and deep-space communications, vehicular communications (including unmanned aerial), and during large-scale disasters
Considers security concerns for DTN and potential for rapid selection and dissemination of urgent messages Reviews the breadth of areas in
which DTN is already providing solutions Covers the prospects for DTN’s wider adoption and development of standards. Over the last few years
vehicular networks have been receiving a lot of attention from academia, industry, standardization bodies, and the various transportation
agencies and departments of many governments around the world. It is envisaged in the next decade that the Intelligent Transportation System
(ITS) will become an essential part of our daily life. This book describes models and/or algorithms designed to investigate evolutionary
solutions to overcome important issues such as congestion control, routing, clustering, interconnection with long-term evolution (LTE) and
LTE-advanced cellular networks, traffic signal control and analysis of performances through simulation tools and the generation of vehicular
mobility traces for network simulations. It provides an up-to-date progress report on the most significant contributions carried out by the
specialized research community in the various fields concerned, in terms of models and algorithms. The proposals and new directions explored
by the authors are highly original, and a rather descriptive method has been chosen, which aims at drawing up complete states of the art as
well as providing an overall presentation of the personal contributions brought by the authors and clearly illustrating the advantages and
limitations as well as issues for future work. Contents 1. Introduction 2. Congestion Control for Safety Vehicular Ad-Hoc Networks 3. Inter-
Vehicle Communication for the Next Generation of Intelligent Transport System: Trends in Geographic Ad Hoc Routing Techniques 4. CONVOY:
Systems and Car-to-Car Communications About the Authors André-Luc Beylot is Professor in the Telecommunication and Network Department of
the ENSEEIHT of IRIT-T, University of Toulouse in France. Houda Labiod is Associate Professor at Telecom ParisTech in the INFRES (Computer
Science and Network) Department, France. Road accidents caused by impaired and distracted driving as well as traffic congestion are on the
rise, with the numbers increasing dramatically every day. Intelligent transportation systems (ITS) aim to improve the efficiency and
safety of traveling by consolidating vehicle operations, managing vehicle traffic, and notifying drivers with alerts and safety messages
in real time. Vehicular Cloud Computing for Traffic Management and Systems provides innovative research on the rapidly advancing
applications of vehicle-to-vehicle and vehicle-to-infrastructure communication. It also covers the need to fully utilize vehicular ad-hoc
network (VANET) resources to provide updated and dynamic information about the conditions of road traffic so that the number of road
accidents can be minimized. Featuring research on topics such as identity management, computational architecture, and resource management, this book is ideally designed for urban planners, researchers, policy makers, graduate-level students, transportation engineers, and technology developers seeking current research on vehicle computational design, architecture, security, and privacy. Vehicular Ad-Hoc Networks (VANETs) play a key role to develop Intelligent Transportation Systems (ITS) aiming to achieve road safety and to guarantee needs of drivers and passengers, in addition to improve the transportation productivity. One of the most important challenges of this kind of networks is the data routing between VANET nodes which should be routed with high level of Quality of Service (QoS) to ensure receiving messages in the time. Then, the driver can take the appropriate decision to improve the road safety. In the literature, there are several routing protocols for VANETs which are more or less reliable to reach safety requirements. In this book, we start by describing all VANET basic concepts such as VANET definition, VANET versus Mobile ad-Hoc Network (MANET), architectures, routing definition and steps, Quality of Service (QoS) for VANET Routing, Metrics of evaluation, Experimentation, and simulation of VANETs, mobility patterns of VANET etc. Moreover, different routing protocols for routing in VANETs will be described. We propose two main categories to be presented: classical routing and bio-inspired routing. Concerning classical VANET, main principles and all phases will be overviewed, as well as, their two sub-categories which are topological and geographical protocols. After that, we propose a new category called bio-inspired routing which is inspired by natural phenomenon such as Ant colony, Bee life, Genetic operators etc. We present also, some referential protocols as example of each category. In this book, we focus on the idea of how to apply bio-inspired principle into VANET routing to improve road safety, and to ensure QoS of vehicular applications. Distributed systems intertwine with our everyday lives. The benefits and current shortcomings of the underpinning technologies are experienced by a wide range of people and their smart devices. With the rise of large-scale IoT and similar distributed systems, cloud bursting technologies, and partial outsourcing solutions, private entities are encouraged to increase their efficiency and offer unparalleled availability and reliability to their users. The Research Anthology on Architectures, Frameworks, and Integration Strategies for Distributed and Cloud Computing is a vital reference source that provides valuable insight into current and emergent research occurring within the field of distributed computing. It also presents architectures and service frameworks to achieve highly integrated distributed systems and solutions to integration and efficient management challenges faced by current and future distributed systems. Highlighting a range of topics such as data sharing, wireless sensor networks, and scalability, this multi-volume book is ideally designed for system administrators, integrators, designers, developers, researchers, academicians, and students. This book focuses on green computing-based network security techniques and addresses the challenges involved in practical implementation. It also explores the idea of energy-efficient computing for network and data security and covers the security threats involved in social networks, data centers, IoT, and biomedical applications. Green Computing in Network Security: Energy Efficient Solutions for Business and Home includes the analysis of green-security mechanisms and explores the role of green computing for secured modern internet applications. It discusses green-computing-based distributed learning approaches for security and emphasizes the development of green computing-based security systems for IoT devices. Written with researchers, academic libraries, and professionals in mind so they can get up to speed on network security, the challenges, and implementation processes. The concept of a smart city has attracted attention from many countries. Intelligent transportation is the critical component in a smart city. To achieve intelligent transportation, all vehicles must be aware of the local and nearby traffic situations to avoid traffic jams. This requires that a vehicle should keep real-time, continuous communications with nearby vehicles as well as the road traffic base stations that connect to the city infrastructure. Vehicle-to-Vehicle and Vehicle-to-infrastructure Communications: A Technical Approach covers the communication hardware and software details as well as system integration models for two important vehicle communication types: vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications. The book starts with a summary of the technical challenges for both types (V2X) of communications, network architectures, protocol stack, and how V2X systems can be used to detect congestion locations and levels. It then introduces a comprehensive and comparative study in a city environment of representative routing protocols developed for inter-vehicular networks and wireless mobile ad hoc networks. The section on V2X Networking Schemes discusses three important network types: Dedicated short-range communication (DSRC), In-cabin Wi-Fi, and Vehicle light communications. The next section on V2X Applications introduces some interesting applications that are based on a V2X platform. The discussion then turns to Antennas for V2X: Multiple input multiple output (MIMO) antenna systems that offer high data rates (gigabit wireless link) and good quality of service (QoS) in non-line-of-sight (NLOS) environments, as well as V2V channel measurements and modeling, which are important for future V2V system designs. The section on Physical Layer Technologies discusses the lowest network stack—the physical layer of V2X platforms. Finally, the book introduces some future technologies that can advance V2X
designs, including a simulation methodology that can implement SDN-based vehicle networks, an explanation of the World Wide Wheels (WWW) concept, and how XG enables the high throughput of V2X. Book jacket.”This book further explores various issues and proposed solutions for the provision of Quality of Service (QoS) on the wireless networks”--Provided by publisher. This book highlights cyber-security overview, perspectives, and challenges that affect advanced Vehicular technology. It considers vehicular security issues and possible solutions, with the aim of providing secure vehicle-to-vehicle, vehicle-to-infrastructure and inside-of-vehicle communication. This book introduces vehicle cryptography mechanism including encryption and decryption approaches and cryptography algorithms such as symmetric and asymmetric cryptography, Hash functions and Digital Signature certificates for modern vehicles. It discusses cybersecurity structure and provides specific security challenges and possible solutions in Vehicular Communication such as vehicle to vehicle communication, vehicle to Infrastructure and in-vehicle communication. It also presents key insights from security with regards to vehicles collaborative information technology. The more our vehicles become intelligent, the more we need to work on safety and security for vehicle technology. This book is of interest to automotive engineers and technical managers who want to learn about security technologies, and for those with a security background who want to learn about basic security issues in modern automotive applications. This comprehensive book unveils the working relationship of blockchain and the fog/edge computing. The contents of the book have been designed in such a way that the reader will not only understand blockchain and fog/edge computing but will also understand their co-existence and their collaborative power to solve a range of versatile problems. The first part of the book covers fundamental concepts and the applications of blockchain-enabled fog and edge computing. These include: Internet of Things, Tactile Internet, Smart City; and E-challan in the Internet of Vehicles. The second part of the book covers security and privacy related issues of blockchain-enabled fog and edge computing. These include, hardware primitive based Physical Unclonable Functions; Secure Management Systems; security of Edge and Cloud in the presence of blockchain; secure storage in fog using blockchain; and using differential privacy for edge-based Smart Grid over blockchain. This book is written for students, computer scientists, researchers and developers, who wish to work in the domain of blockchain and fog/edge computing. One of the unique features of this book is highlighting the issues, challenges, and future research directions associated with Blockchain-enabled fog and edge computing paradigm. We hope the readers will consider this book a valuable addition in the domain of Blockchain and fog/edge computing.”This book attempts to close the gap between science and technology in the field of roadside backbones for VCNs”--As a component of the intelligent transportation system (ITS) and one of the concrete applications of mobile ad hoc networks, vehicular networks are attracting an extensive attention from both academia and industry. The most important feature of these networks is their ability to extend the horizon of drivers and on-board devices and, thus, to make the time spent in vehicle enjoyable to both driver and passengers and improve road traffic safety and efficiency. Nevertheless, it is not usually easy to develop such systems due to the constraints related to the vehicular environment such as the road’s architecture and the high mobility of nodes. These different properties offer two major challenges which are (i) offering sufficient QoS, and (ii) limiting the generated overhead. In this thesis, we focused on both vehicle to vehicle communication and vehicle to infrastructure communication. We tried to propose some optimized solutions that improve the quality of service in vehicular networks while generating a limited overhead and make easier the deployment of new services. First, we focused on the address configuration and mobility management in vehicular networks which are basic issues that act as pedestals to all other items. We proposed a multicast-communication-based solution to minimize the handover delays. Then, we bend over to study three major items in the vehicular network context: (i) data dissemination, where we proposed a local intersection-aware data dissemination protocol called ROD, (ii) data collection, where we proposed CGP protocol. This later is based on both cellular network and V2V communications, and (iii) self organization, where we proposed a self-organizing architecture based on geographic clustering. The performances of the different contributions were evaluated via simulations studies. Some of them were also evaluated analytically or/and via on-road real tests.

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