1. Record Nr. UNINA9910132163003321

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Titolo	Bio-inspired routing protocols for vehicular ad-hoc networks / / Salim Bitam, Abdelhamid Mellouk
Pubbl/distr/stampa	London, England : , : Wiley, , [2014] ©2014
ISBN	9781119004967 (electronic book) 1-119-00813-1 1-119-00496-9 1-119-00812-3
Descrizione fisica	1 online resource (127 pages)
Collana	Focus series
Disciplina	388.3124
Soggetti	Vehicular ad hoc networks (Computer networks) Routing protocols (Computer network protocols)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Cover page; Half-Title page ; Title page; Copyright page; Contents; Preface; Introduction; Acronyms and Notations; 1: Vehicular Ad Hoc Networks; 1.1. VANET definition, characteristics and applications; 1.1.1. Definition of vehicular ad hoc network; 1.1.2. Characteristics of vehicular ad hoc networks; 1.1.2.1. Vehicle velocity; 1.1.2.2. VANET density; 1.1.2.3. Node heterogeneity; 1.1.2.4. Mobility model; 1.1.3. Applications of vehicular ad hoc networks; 1.1.3.1. Road safety applications; 1.1.3.2. Vehicular authority services; 1.1.3.3. Enhanced driving 1.1.3.4. Business and entertainment services1.2. VANET architectures; 1.2.1. Vehicular WLAN/cellular architecture; 1.2.2. Pure ad hoc architecture; 1.2.3. Hybrid architecture; 1.3. Mobility models; 1.3.1. Random-based mobility models; 1.3.1.1. Random waypoint mobility model; 1.3.1.2. Random walk mobility model; 1.3.1.3. Limitations of random-based mobility models; 1.3.2. Geographic map-based mobility models; 1.3.2.1. Manhattan grid mobility model; 1.3.2.2. City section mobility model; 1.3.2.3. Freeway mobility model; 1.3.2.4. Limitations of

geographic map-based mobility models
1.3.3. Group-based mobility1.3.3.1. Reference point group mobility model; 1.3.3.2. Virtual track mobility model; 1.3.3.3. Limitations of group-based mobility model; 1.3.4. Prediction-based mobility models; 1.3.4.1. Gauss-Markov based mobility model; 1.3.4.2. Markov-History based mobility model; 1.3.4.3. Discussion of prediction-based mobility models; 1.3.5. Software-tools-based mobility models; 1.3.5.1. SUMO framework; 1.3.5.2. VanetMobiSim framework; 1.3.5.3. MOVE framework; 1.3.5.4. Discussion of software-tools-based mobility models; 1.4. VANET challenges and issues; 1.4.1. VANET routing 1.4.2. Vehicular network scalability1.4.3. Computational complexity in VANET networking; 1.4.4. Routing robustness and self-organization in vehicular networks; 1.4.5. Vehicular network security; 1.5. Bibliography; 2: Routing for Vehicular Ad Hoc Networks; 2.1. Basic concepts; 2.1.1. Single-hop versus multi-hop beaconing in VANETs; 2.1.1.1. Single-hop beaconing; 2.1.1.2. Multi-hop beaconing; 2.1.2. Routing classification of VANETs; 2.1.2.1. Topology-based routing; 2.1.2.1.1. Proactive routing; 2.1.2.1.2. Reactive routing; 2.1.2.1.3. Hybrid routing; 2.1.2.2. Geography-based routing
2.1.2.3. Cluster-based routing2.2. Quality-of-service of VANET routing; 2.2.1. Quality-of-service definition; 2.2.2. Quality-of-service criteria; 2.2.2.1. Average end-to-end delay (measured in milliseconds); 2.2.2.2. Average jitter (measured in milliseconds); 2.2.2.3. Average available bandwidth (measured in KB/s); 2.2.2.4. Packet delivery ratio; 2.2.2.5. Normalized overhead load; 2.3. VANET routing standards; 2.3.1. Dedicated short range communication; 2.3.2. Standards for wireless access in vehicular environments (WAVE); 2.3.3. VANET standards related to routing layers
2.3.3.1. Controller area network (ISO 11898)

Sommario/riassunto

Vehicular Ad-Hoc Networks (VANETs) play a key role to develop Intelligent Transportation Systems (ITS) aiming to achieve road safety and to guaranty 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