

Editorial

Data Disseminations in Vehicular Environments

Dongkyun Kim,¹ Juan Carlos Cano,² Wei Wang,³ Floriano De Rango,⁴ and Kun Hua⁵

¹ School of Computer Science & Engineering, Kyungpook National University, Daegu 702-701, Republic of Korea

² Universidad Politécnica de Valencia, Camino de Vera, S/N, 46022 Valencia, Spain

³ Department of Electrical Engineering and Computer Science, South Dakota State University, Brookings, SD 57007, USA

⁴ Department of Informatics, Electronic and Sistemistic, University of Calabria, 87036 Cosenza, Italy

⁵ Department of Electrical and Computer Engineering, Lawrence Technological University, Southfield, MI 48075, USA

Correspondence should be addressed to Dongkyun Kim; dongkyun@knu.ac.kr

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Vehicular ad hoc networks (VANETs) have been attracting researchers worldwide. Until now, VANETs have been considered novel wireless networks for the Internet access and data transfer during users' driving along with a wide range of applications. Researchers focus on vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications while providing different applications including safety and environmental awareness. Main contributions have focused on different communication protocols from physical to application layers. This new paradigm can be used to face complex problems with high requirements such as end-end connection, self-configuration, and self-repairing through network while providing services.

This special issue provides recent routing and data dissemination schemes in vehicular environments, thus featuring current and future research waypoints in the field of VANETs.

The paper titled "A stable routing protocol for vehicles in urban environments," proposed by H. Yu et al., describes a new idea of improving the network performance by establishing routes of roads with higher vehicle density. The proposed scheme outperforms existing solutions for vehicular environments like A-STAR and GPSR in terms of less routing overhead and better packet delivery.

A clustering scheme for ITS has been proposed by Y. Lin et al. in "An adaptive clustering scheme for improving the scalability in intelligent transportation systems." The authors propose a solution for the scalability problem of the Internet access in ITS through an adaptive gateway dispatching technique where gateways are dynamically selected according to the specific application's requirements.

The paper titled "An efficient data dissemination protocol with roadside parked vehicles' assistance in vehicular networks," proposed by H. Gong et al., provides an efficient data dissemination protocol for multihop data delivery in VANETs. This protocol supports parked vehicles by the roadside to help forward packets. Clusters of parked vehicles assist in delivering data especially in an environment where the density of mobile vehicles is low.

The paper titled "Broadcasting with prediction and selective forwarding in vehicular networks," proposed by J. Yang et al., presents a message broadcasting algorithm for VANETs. Through simulation work, it is observed that the proposed algorithm outperforms other probabilistic and distance-based approaches by letting a sender node to select the best node among its neighbors that can rebroadcast the message fastest to other nodes.

"Dubhe: a reliable and low latency data dissemination mechanism for VANETs," proposed by L. Zhang et al., presents an one-hop data transmission algorithm along with a theoretical analysis of reliability and retransmission. RSUs are exploited to collect the traffic densities and estimate the real-time transmitting delay between RSUs and a minimum delay path for packets is selected.

A survey for dynamic channel coordination written by H. Yoo et al. is introduced in the paper titled "Dynamic channel coordination schemes for IEEE 802.11p/1609 vehicular networks: a survey," where multichannel operations and improvements for WAVE standard (IEEE 802.11p/1609) are explored. Qualitative analysis for different schemes has been carried out with multiple aspects such as cooperation with RSU, control message overhead, interval division criterion,

and traffic conditions. Furthermore, some research directions of future works in dynamic interval division protocols for VANETs are discussed.

R. Woo et al. present two analytical models for vehicular communication network to process safety and nonsafety messages in their manuscript “*Performance analysis for priority-based broadcast in vehicular networks.*” A Markov chain model is proposed to evaluate the communication performances of V2V. The throughput, channel utilization, and end-to-end delay are evaluated. These models can be used to estimate the performance of vehicular communication networks to provide priority services.

A handover scheme for IEEE 802.11p-based networks is presented in “*Proactive caching and forwarding schemes for seamless handover in IEEE wave networks,*” proposed by H. Lee et al. The proposed scheme uses the multicasting to forward data packets to all candidate RSUs for proactive caching. The n RSUs send IEEE 802.11f move-notify messages to the other candidate RSUs in order to avoid the wastage of radio resources caused by repeated retransmissions of data packets.

The paper titled “*Routing optimization in vehicular networks: a new approach based on multiobjective metrics and minimum spanning tree,*” proposed by P. Fazio et al., is also included in this special issue. A new routing scheme based on the optimized path length and link duration is presented. A new multiobjective metric, based on the evaluation of cochannel interference levels, end-to-end delay, and link duration along the different links from sources towards destinations, has been discussed.

“*Seamless QoS-enabled handover scheme using CoMP in fast moving vehicular networks,*” proposed by S. Chae et al., proposes a handover scheme utilizing CoMP for high-speed moving vehicular networks. The CoMP concept is handled by multiple outside transceivers and a CCF. Seamless connections are maintained between the outside transceivers and eNode.

The paper titled “*Secrecy-enhanced data dissemination using cooperative relaying in vehicular networks,*” proposed by L. Sun et al., presents a relay-aided data dissemination protocol for VANETs. The authors focus on a superposition coding with opportunistic relaying techniques for secure communications. By using the information theory, the authors validate their work for realistic systems in future.

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Dongkyun Kim
Juan Carlos Cano
Wei Wang
Floriano De Rango
Kun Hua



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