

# Editorial

---

This fourth issue of *CIT. Journal of Computing and Information Technology* brings a paper on parallelization for manycore processors, three papers on various aspects of routing in wireless networks, as well as a survey paper on quality of service and quality of experience in wireless networks.

Algorithm parallelization for a manycore processor is the topic of this issue's first paper. *Parallel Algorithm for Frequent Itemset Mining on Intel Many-core Systems* by Mikhail L. Zymbler describes a parallelized implementation of a known association rule algorithm called Dynamic Itemset Counting (DIC), which can be used in the case where the transactional database fits into the main memory. The specific processor thus addressed is Intel's Xeon Phi, providing a large number of small compute cores with vector processing units, while the parallel implementation is based on OpenMP technology and thread-level parallelism. The author claims that by exploiting bit-based internal layout for transactions and itemsets a number of improvements are achieved: reduction of memory space for storing the database, simplification of support count along with its vectorization. The effectiveness of the algorithm is evaluated through speedup and parallel efficiency with respect to known algorithms, resulting both in good performance and scalability.

The authors of the next paper, Lu Yan and Ding Xiong, study routing protocols for Wireless Mesh Networks (WMNs), a type of multi-hop, self-organizing and self-healing broadband wireless networks mostly intended to serve as wireless metropolitan area backbones. They note that standard routing protocols for WMNs lack effective load balancing mechanisms, as in known solutions some nodes take more tasks, while others are idle, hence not making full use of WMN resources. Thus in their paper titled *An Improved Dynamic Load Balancing Routing Protocol Based on Mesh Networks*, they introduce one such improved protocol – Load Balanced Dynamic Source Routing Mechanism (LBDSRM), which is based on the standardized reactive Dynamic Source Routing protocol (DSR), and uses a cost-effective integrated link state calculation. In order to overcome both load balancing and fairness, the authors apply cost-effective integrated link state routing along with real-time back-off. Simulation results show advantages of LBDSRM with respect to other comparable WMN routing protocols, especially in heavy network load.

Ravdeep Singh Boparai, Anastasios Alexandridis and Zeljko Zilic consider security issue in embedded systems. In their paper titled *Multi-Point Security by a Multiplatform-Compatible Multifunctional Authentication and Encryption Board*, they describe an authentication and encryption system for password-free access over a secured link for multiple devices within an Internet-of-Things (IoT) context. The authentication procedure includes the exchange of certificate and challenge/response pairs, which are stored and computed in an external ASIC security coprocessor. Sensitive authentication elements such as keys, certificates, and challenge responses are invisible to users and are exchanged using strong hashing algorithms, thus making system security hardened. A working prototype implementation has been tested, the obtained results demonstrating energy efficiency, ability to support multi-point functionality, high throughput, along with high-security level protection.

The other paper in this *CIT* issue dedicated to routing in wireless networks, specifically in MANETs, is *Security Enhanced Location-aided Level Based Disjoint Multipath Routing Algorithm for Mobile Ad Hoc Networks* by Vasudevan Muthupriya and Sathyanarayanan Revathi. The authors address the two challenging problems in MANETs which are due to energy and resource constraints at each node, i.e. routing overhead and security. Since existing security protocols, which base their

operation either on cryptographic manipulations or source/destination anonymous routing, imply increase of cost or overhead, the authors advocate topology hiding during route discovery phase as the mechanism for preventing the inclusion of attacker nodes in the routing path. Thus, they developed two location-based algorithms: Enhanced Location-aided Level-based node Disjoint Multipath routing (ELLDMR) to improve link lifetime, and Secure Location-aided Level-based node Disjoint Multipath routing (SLLDMR) to enhance MANET security. Simulation results show reduced routing overhead, less end-to-end delay, and higher packet delivery rate compared to present solutions.

In the last paper of this issue, Benmir Abdelkader, Korichi Ahmed, Bourouis Abdelhabib and Al-reshoodi Mohammed provide an appraisal of Vehicular Ad-hoc Networks (VANETs), with respect to quality of multimedia communication. Since the main objective of VANETs is achieving safe and comfortable driving, the transmitted data is mostly multimedia, therefore implying the need to assess not only network service parameters through Quality-of-Service (QoS), but also user and context factors through Quality-of-Experience (QoE), this latter emphasizing the degree of users' satisfaction with the offered network service. In their paper titled *Survey on QoE/QoS Correlation Models for Video Streaming Over Vehicular Ad-hoc Networks*, the authors consider the associated research work on Quality of Experience (QoE) for video streaming over VANETs. They outline and compare a number of QoE and QoS models, identify their limits and deficiencies, and discuss challenges and real problems that need to be addressed.

Vlado Glavinić  
Editor-in-Chief