Editorial

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Biographical notes: Khairol Amali Bin Ahmad obtained his BSc in Electrical Engineering from the US Military Academy, West Point, in 1992 and MSc in Military Electronic Systems Engineering from Cranfield University, in 1999. While serving in the Malaysian Army, he was positioned to various posts and units including those dealing with engineering maintenance and procurement consultation of equipment. He then joined the National Defence University of Malaysia (NDUM) and completed his PhD from ISAE-SUPAERO, France, in 2015. Currently, he is the Dean of the Engineering Faculty. His areas of research are signal processing related to signal propagation in tropical areas, mesh networks for IoT applications and delay/disruption tolerant networks (DTN).

Jiradett Kerdsri is currently the Deputy Director of Data Analytics at the Bank of Thailand. For the past decade, he was the Director of Data Communication at the Defense Technology Institute, The Kingdom of Thailand. He completed his PhD in Opportunistic Networks from the Sirindhorn International Institute of Technology (SIIT), Thammasat University, Thailand, in 2015. He obtained his MSc in Computer Science from The US Naval Postgraduate School, in 2003. He obtained his MSc in Geographic Information Technology from the University of Melbourne, Australia, in 2009. His research interests include data communication, opportunistic network, machine (deep) learning and data science techniques. He has published various papers on opportunistic networks in reputed journals and conferences.

Khaleel Ahmad is currently an Assistant Professor in the Department of Computer Science and Information Technology at Maulana Azad National Urdu University (A Central University), Hyderabad. He has visited the National Defence University of Malaysia (UPNM), Malaysia as a Visiting Faculty. He holds a PhD in Computer Science and Engineering and MTech in Information Security. His research areas are opportunistic network, blockchain technology, cyber security and cryptography. He has filed two international patents from Malaysia. He has 35 published papers in refereed national/international journals and conferences (viz. Springer, Elsevier, ACM, IEEE, InderScience, Bentham Science and Tech Science Press) and ten book chapters (Springer, CRC Press, IGI Global and Wiley).

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It is a great pleasure for us to present to you this special issue. The acceptance rate of the issue was 47%. Therefore, the purpose of this special issue is well fulfilled in order to have high-quality research papers.

Ganesan et al. worked on sensor deployment that was able to provide maximum coverage and maximum connectivity with less energy consumption to sustain the network lifetime. The maximum quality coverage problem has been solved successfully by an evolutionary algorithm while placing nodes in optimal position. In this paper, a novel genetic algorithm with second generation wavelet transform (SGWT) is proposed for identifying optimal potential position for node placement. In order to improve the quality of population matrix, bi-orthogonal Cohen Daubechies Feauveau wavelet (CDF 5/3) has been employed.

Ahamed and Chishti performed a detailed survey on semantic interoperability in the applications of internet of things. This survey disseminates that there are huge opportunities in the field of semantic interoperability. This survey leads to illustrate this topic thoroughly providing a relevant and valuable collection of desired data. This research activity is effective for the researchers to single out the approach and state of semantic interoperability. Different types of techniques for achieving semantic interoperability were analysed. During the study of the survey, it was found that there is no specific approach for the analysis of heterogeneous data. Design of techniques for semantic interoperability depends on the research purpose and for what area it is to be implemented. From inception to till now, the researchers have designed it in their own way, but still lack a common method of achieving semantic interoperability in IoT.

Hossen et al. analysed the impact of contacts for varying message copies, mobile nodes, and buffer size in delay-tolerant networks. Using an opportunistic network environment simulator for the analysis, the authors showed that the number of contact increases per hour with the increase of mobile nodes, while it goes up and down when varying the message copies and remains approximately the same when changing the buffer sizes. However, inter-contact time (ICT) is high at the beginning of the communication for three cases, i.e., for varying message copies, mobile nodes and buffer size.

Kumar et al. proposed a multi-parameter-based resource allocation technique to schedule radio resources for real-time and non-real-time users simultaneously. Parameters, such as queue length, head of a line delay, and channel conditions are weighted differently based on the priority of service types of the users. Then, a utility function is designed by considering weighted parameters to maximise the utilities corresponding to real-time and non-real-time users. The utility function for real-time users is considered as a sigmoidal-like function and for non-real-time users is considered as a logarithmic function, which correctly describes the ongoing service of the user. Now, it becomes a network utility maximisation problem and so a globally optimal solution is derived for this. The obtained solution guarantees a minimum rate (or resource) allocation to all the users while allocating a high number of radio resources to prioritised users.

Khan and Singh proposed a realistic hybrid trust model to detect and alleviate various adverse effects by estimating the trust scores of sensor nodes quantitatively. TASRP is a multifactor routing approach that employs trust scores of nodes, residual energy, and path length to provide reliable routing paths among trusted nodes with reduced energy consumption. This multifactor strategy helps in selecting trusted nodes to forward data and minimise energy consumption due to shorter routing paths. Simulation results show better performance in terms of robust trust values, throughput, packet delivery rate, and energy consumption of nodes.

Banyal et al. proposed a probabilistic routing protocol optimised by the firefly algorithm. The proposed scheme employs firefly PSO to optimise the conventional PRoPHET routing algorithm which uses delivery probability consideration through a history of encounters and transitivity. Using firefly PSO, the PRoPHET parameters were morphed, and using the contextual information available, the forwarding decision was made. The scheme was compared with PRoPHET protocol to showcase enhanced performance across successful delivery, average latency, buffer ratio among other parameters.

Sharma et al. proposed a routing protocol called hierarchical search-based routing protocol for opportunistic networks which deals with dividing the geographical area being serviced by the network into atomic zones. The message delivery in these zones is taken care of by respective ferries responsible for that zone. The atomic zones are then combined to form larger logical zones forming a hierarchy of zones, the routing between which is taken care by Infostations. This system is analogous to the post system in any country, wherein the letters are routed between the different post stations in the country, and then in the specific zone of a post station, the postmaster takes care of delivering the post.

Almayouf et al. aimed to manage levels of CO_2 inside King Abdulaziz Road Tunnel in Makkah, Saudi Arabia, by using heterogeneous systems and devices that can interact with each other and share resources in an ad hoc manner through various communication media to achieve a certain goal. To do this, they propose using oppnet virtual machine (OVM) which can be downloaded to any device making it oppnet-enabled. The authors' goal of managing the levels of CO_2 inside the tunnel can be achieved by making the sensors, fans, and tunnel's billboard oppnet-enabled devices to allow them to collaborate and share resources autonomously.

Our heartfelt thanks go to the Editor-in-Chief, members of the editorial board, and reviewers who had reviewed the papers to print this special issue on the scheduled date within the time limit. We are also thankful to those authors whose manuscripts for this special issue could not be accepted and would like to urge them to resubmit the paper after modifying it as per reviewers' suggestions to upcoming issues or another journal.