Preface

Vijay Bhasker Semwal*

Indian Institute of Information Technology, Dharwad,
3rd floor, IT Park, Hubli-Dharwad Hwy,
Deshpande Nagar, Hubali-Dharwad,
Karnataka 580029, India
Email: vsemwal@gmail.com
*Corresponding author

Vijender Kumar Solanki

CMR Institute of Technology (Autonomous),
Kandlakoya (V), Medchal (M), Hyderabad,
Telangana 501-401, India
Email: spesinfo@yahoo.com

Rubén González Crespo

School of Engineering,
Universidad Internacional de La Rioja (UNIR),
Logroño, Spain,
Email: ruben.gonzalez@unir.net

Biographical notes: Vijay Bhasker Semwal is working as an Assistant Professor (CSE) at the IIIT Dharwad since August 2016. He has served as ad hoc faculty at the NIT Jamshedpur for six months (January 2016–August 2016). He has completed his PhD and MTech from the IIIT Allahabad. He has served as a Senior System Engineer at the Siemens India Ltd 2012-2013. He has published 15 SCI journal and ten top-tier conference papers. He has achieved many awards and IEEE Best Volunteer Award-2017, India.

Vijender Kumar Solanki is an Associate Professor in the Department of Computer Science and Engineering, CMR Institute of Technology (Autonomous), Hyderabad, TS, India. He received his PhD in Computer Science and Engineering from the Anna University, Chennai, India. He is an editor in *International Journal of Machine Learning and Networked Collaborative Engineering* (*IJMLNCE*) ISSN: 2581-3242, and Associate Editor in *International Journal of Information Retrieval Research* (*IJIRR*), IGI-GLOBAL, USA, ISSN: 2155-6377. He has authored or co-authored more than 20 research articles that are published in journals, books and conference proceedings. He has edited or co-edited 04 books in the area of information technology.

Rubén González Crespo holds a PhD in Computer Science Engineering. Currently, he is the Dean of Higher School of Engineering from UNIR and Director of the AENOR (Spanish Association for Standardization and Certification) Chair in Certification, Quality and Technology Standards. He is an advisory board member for the Ministry of Education at Colombia and

evaluator from the National Agency for Quality Evaluation and Accreditation of Spain (ANECA). He is a member of different committees at the ISO organisation.

In the current technological environment, information technology [internet of things (IoT)] is utilising benefits from machine learning and IoT-ased applications. In order to elicit quality articles for this special issue, the editors circulated a call for papers to the research and academic community and received a number of quality papers. However, due to scope of this special issue, the editors were able to only accept four papers and one general paper for this special issue. We are thankful to all contributing author's for supporting this long awaited issue which is presented before you.

The aim of this special issue is to explore ample knowledge and publish relevant research for the international community through the *Journal of Internet of Things and Cyber-Assurance*, a journal published by Inderscience. This special issue addresses original research on the theory, design and implementation of machine learning and IoT, with the intention to contribute knowledge to the academic and practitioner communities.

In the first paper, entitled 'Use of adaptive algorithm for impulsive noise cancellation', authored by Sarthak Panda and Mihir Narayan Mohanty, shares the desire of clean signals at the user end is in great demand. Adaptive algorithms are most suitable for such task. In this paper authors have taken an attempt for synthetic signal contaminated with impulsive noise. Further its application has been extended to noisy biomedical signal as ECG. It is very important to eliminate noise from the biomedical signal, as its occurrence is sudden and often similar to the signal. The popular adaptive algorithms have been used for cancellation of impulsive noise. Though different algorithms have been applied earlier, the novelty in this work is application of Wilcoxon LMS for impulsive noise case. Also it has been modified for the same purpose. The result found excellent in terms of less MSE, SNR improvement and faster convergence. The proposed algorithm has shown excellent result for noise removal. Though impulsive noise is complex, it is removed using the proposed algorithm and the SNR has been improved almost three times than standard LMS algorithms. The implementation of the algorithm can be useful for modern medical equipment and can be extended for future work.

In the second paper, entitled 'Design and study of dual band slotted patch radiator using bio-inspired optimisation approach for wireless communication', authored by Swarnaprava Sahoo, Mihir Narayan Mohanty and Rabindra Kishore Mishra, propose a new dual band slotted patch radiator for Wi-MAX and satellite applications purposes. The two wide appropriate rectangular slots in opposite faces of the non-radiating edge of the patch and an I-shaped slot in between the two wide slots are embedded in the radiating element for good impedance matching. Particle swarm optimisation (PSO) and firefly algorithm (FA) are used for optimum dual band performance. The optimised proposed radiator is demonstrated, fabricated and experimentally verified. The simulated and experimental results give good agreement. The performances of the radiator are optimised with the help of optimisation technique like PSO, FA on the basis of antenna optimiser by selecting the most proper configurations parameters. From observation and analysis it is concluded that the FA gives the better result than the PSO.

In the third paper, entitled 'Dictionary-based intra-prediction framework for image compression via sparse representation', authored by Arabinda Sahoo and Pranati Das, the

paper presents a dictionary based intra prediction framework for image compression using sparse representation, with the construction of trained over-complete dictionaries. The intra-prediction residuals selected from different images and K-SVD algorithm are used to train over-complete dictionaries. In this paper, a novel image compression method based on intra prediction and sparse representation has been introduced. A dictionary is designed using a variety of residual blocks obtained from intra prediction and K-SVD algorithm in order to sparsely represent residual image. They have also developed an adaptive sparse image partitioning method to achieve efficient sparse representation with fewer dictionary coefficients. Our image compression method reduces the coding rate during intra prediction level as well as at sparse representation level. Experimental results show that the proposed compression method provides significant improvements in coding efficiency and image quality as compared to JPEG and JPEG2000.

In the fourth paper, entitled 'Employing an efficient tamper detection mechanism for IoT-based healthcare systems', authored by Ahmed A. Elngar, shows a work on security of large scale networks of IoT which is the most significant challenge that needs a smarter security mechanism. Therefore, tamper detection (TD) is an efficient security mechanism for IoT-based healthcare system, which used to deal with security violations. Since there are many security threats affect the originality of medical information. In this paper, a new TD mechanism for IoT-based healthcare systems called (IOT-TD) model has been proposed. This paper effectively proposed (ANN-GA) TD mechanism. Where, genetic algorithm (GA) is used to optimise weight and bias values of artificial neural networks (ANN), which lead to maximise the detection accuracy, minimise the timing detection speed and the efficiency energy saving of IoT-network modules. The experimental results showed that the TD performance of (ANN-GA) is 98.51%. In addition, the proposed model showed that the (ANN-GA) enhances the timing detection to 0.03 sec which is important for real time (IOT-TD) model healthcare system and the efficiency energy saving transmission is 1,980 times better than full transmission. Also, the proposed model relies on the certificate-based datagram transport layer security (DTLS) handshake protocol as it is the main security for (IoT-TD) model. We are very much thankful to authors' who support and keep faith in our guest editorial process, It takes more than a year to complete this issue, I am sure their work will be well recognised by the researchers and readers who are working in engineering and informatics domain.

We are thankful to the Editor-in-Chief, Dr. Tyson T. Brooks, who has provided this opportunity to develop this special issue on machine learning and the IoT. We are also thankful to the national and international reviewers who patiently reviewed and suggested the suitable suggestions to authors in improving the quality of their articles. Furthermore, we are thankful to our Institution's Principal, IIIT Dharwad, Karnatka, India and CMRIT (Autonomous), Hyderabad, who provided us an ample open platform to serve our guest editor duties honestly. We are sure this learning will be helpful for us in our research and academic exploration.

Though utmost care has been done by the editors in preparing this special issue, we still welcome your critical feedback and suggestions in assisting us in providing improved research for future works.