Editorial

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Biographical notes: Budati Anil Kumar is a full time Associate Professor in the Gokaraju Rangaraju Institute of Engineering and Technology (GRIET – Autonomous), Hyderabad, India. His research interests mainly focus on wireless communications, signal processing and cognitive radio networks. He has published more than 30 peer reviewed international journal and conferences papers, delivered guest lectures and acted as various committee chairs in national and international conferences. He acts as a guest editor for various highly indexed and high impact factor journals. He acts as an editor for the book of *Cognitive Computing*, Taylor and Francis Publisher (CRC Press). He is a member of the IEEE, IEI and IAENG from 2018, and has served as reviewer for various international journals. He has received his BTech from the VYCET, JNTU, Hyderabad, in 2007, Master of Technology from LBRCE, JNTUK, Kakinada University, in 2010, and PhD from GITAM Deemed to be University, India, in 2019, respectively.

Steve S.H. Ling received his PhD from the Department of Electronic and Information Engineering in Hong Kong Polytechnic University, in 2007. Currently, he works in the University of Technology Sydney, Australia as a Senior Lecturer. He has authored and co-authored over 200 books, international journal and conference papers on artificial intelligence and its industrial

applications. His current research interests include deep learning in medical imaging, brain computer interface and AI-based biomedical applications. Currently, he serves as an associate editor for *IET Electronics Letters* and *Sensors*.

Peter Ho Chiung Ching received his PhD in Information Technology from the Faculty of Computing and Informatics, Multimedia University. His doctoral research work was on the performance evaluation of multimodal biometric systems using fusion techniques. He is a senior member of the Institute of Electrical and Electronics Engineers. He has published a number of peer reviewed papers related to location intelligence, multimodal biometrics, action recognition and text mining. He is currently an Adjunct Senior Research Fellow in the Department of Computing and Information Systems, School of Science and Technology, Sunway University.

The focus of this special issue is to present the latest development in cognitive radio (CR) networks with artificial intelligence (AI).

This special issue aims to provide and improve the state-of-the-art of worldwide R&D communities in wireless communication networks, due to the exceptional flow in data traffic experienced over the last decade, it has stretched the telecommunications wireless mobile networks to their capacity.

To improve the spectrum utilisation capacity more efficient ways of novel algorithms or technologies are required. In this context, CR technologies have attracted the interest of the research community over the last few years, as an enabler for dynamic spectrum access. It has found unlimited applications not only to resolve the usage of spectrum issues in telecommunications but to provide solutions in interdisciplinary area applications.

Recently, the migration of AI technologies in CR networks has revolutionised how wireless communications networks are managed. A unique feature of global information presentation capabilities: CR networks, spectrum sharing, sensing and computing technologies are a unique feature of global information presentation capabilities that are being converted into nano-world engineering systems to meet the society needs with advanced technologies like AI, machine learning, deep learning, etc.

The adoption of AI promises self-adaptive and reconfigurable networks also able to provide reliability, energy, spectrum efficiency, etc. Based on its potential, AI is expected to be a keystone of future CR and spectrum sharing solutions. It provides a platform for the researchers, academicians and industrialist to discuss the advances in CR networks: cognitive radio ad hoc networks (CRAHN's), data transmission, information storage, AI in securities, network controls, computing technologies and transmission.

The prime aim of this special issue is to motivate researchers to publish their latest research with works focusing on the issues, and challenges and their solutions in the field of AI-enabled CR networks.

Saileela, P.V.R.N.S.S.V. and Rao, N.N.M. proposed his research on the social network platform such as Twitter enables the opportunity to express an opinion about an event of entertainment, administration, politics, or product, which is equally available to every individual. The opinions those expressed are enabling to prevent other target audiences from the negative impacts or encourage entailing the positive impacts. On another variant, the decisive team of the corresponding target event or product can reframe their decisive factors according to the target audience's views. Hence, sentiment

analysis to identify the opinion polarity is becoming a mandatory fact of the decisive factors. Machine learning is a product strategy in this regard. The other option of opinion polarity assessment is the method of analysing polarity by sentiment lexicons, which is considerably scaled-down. This is since the opportunity of having high volumes of input data with considerable variance in a projection of opinion. Regarding this argument, this manuscript portrayed a novel method that learns from the correlated attributes impact fitness (CAIF) to identify the opinion polarity. In this regard, the attribute impacts have scaled towards positive or negative polarity. The experimental study evincing the performance advantage of the proposal compared to other contemporary models.

Prasad, Y. and Manjula, J. describes the designing of the variable gain amplifier for 5G receivers. Novel gain boosting technique is introduced in order to achieve more amplification at a higher frequency. The designed variable gain amplifier provides continuous gain from 3.5 GHz to 4.2 GHz frequency range. At the frequency of 700 MHz, the noise spectral density is 30.3936 nV/√Hz. The designing and simulations are performed using the TSMC 45 nm process technology using the Cadence Virtuoso tool. The overall power consumption is 0.0156 mW under the supply voltage to 1 V.

Kumar, A.P. et al. proposed research on wireless telecommunication system is increasing with rapid growth. In order to boost the gain and radio bandwidth of the antenna, the multiband functions are playing a vital role. The prime motto of this article is to high gain with a tagged-T antenna, it is designed with truncated ground for multiband applications. The proposed antenna covers a frequency in the range of 2 GHz to 10 GHz. The structure has led to an outstanding requirement of multiband antennas because of the growing multi-utility structure. The notch on the antenna facilitates the multiband activity, improvise the gain. The alteration of the ground face will assure the improvement of the radio band. The antenna is developed with Rogers substrate with a dielectric consistent of 4.4, fall tangent of 0.0009 and having a density of 1.6 mm. The proposed antenna is used for various applications such as X-band, satellite applications, etc. The simulation results are verified with the aid of Ansys HFSS software. This design achieves the S11 losses are –31.54 dB and –30.02 dB at respective frequencies 8.84 GHz and 3.40 GHz. Similarly, the gain is 1.75 dB and bandwidths of 5.4 GHz.

Suseela, R.S.U. and Murty, K.S.N. done research on internet of things (IoT) applications are increasing exponentially in the day to day life. The DC power consumption of an IoT radio is a critical design specification, and it directly influences the battery life and usage. Recently, both academia and industry involved in the design of such radio at low power with the innovative receiver and transmitter architectures. The 2.4 GHz Bluetooth low energy (BLE) and ZigBee transceivers are suitable for IoT applications with relaxed specifications requirements. This paper presents a review of the various low power ZigBee/BLE receiver architectures, and circuit design techniques include low voltage, sub-threshold and current reuse. Similarly, the circuit design techniques in the on-off shift keying (OOK) receivers for IoT and Wake-Up applications presented.

Shilpa, B. et al. describes her research on micro strip circular patch antenna with internal feed antenna with an oblong slot on the radiation part for the dual-frequency operation is proposed. The proposed antenna resonates at two frequencies, i.e., 2.45 GHz and 5 GHz, which can be used in applications like WLAN. The field configuration of the circular patch micro strip antenna can be analysed with the help of modes. The mode buoyed by the micro strip circular patch antenna can be analysed by considering the ground plane, the dielectric material between the ground plane and the patch as a cavity

which is of circular type. The modes of the antenna with circular patch can be controlled by the means of a factor which is called radius. VSWR ratio is maintained below 2 for both bands operating in two different frequencies. The dominant mode for circular patch is TM11. The design can be made to resonate in TM10 and TM11. In both the modes, there is no change in the radiation characteristics and plane of polarisation also does not change. By operating in two different frequency bands, we can able to achieve good radiation characteristics without affecting the VSWR thus providing good impedance matching for the two operating frequency bands.

Before closing this editorial, we would like to thank all authors who submitted manuscripts to this special issue. We received many worthy papers but unfortunately, we could not accommodate all of them, also due to time and scheduling considerations. We would also like to thank the many diligent referees who helped in the evaluation of the submitted manuscripts with their very careful and timely reviews, and at times multiple reviews, as well as Prof. Jianbo Su, the Editor-in-Chief of the *International Journal of Systems, Control and Communications*, who gave us the opportunity to edit this special issue and ensured that the process is kept under control with his guidance and prompt response to each of our requests. Our hope is that this special issue will stimulate researchers in both academia and industry to undertake further research in this challenging field. We are also grateful to the Inderscience Publisher Editorial Office for their support throughout the editorial process.