Preface

Prachi Deshpande*

Dr. Babasaheb Ambedkar Technological University,
Lonere-402103, Maharashtra, India
Email: deprachi3@gmail.com
*Corresponding author

S.C. Sharma

DPT,
IITR Saharanpur Campus,
Indian Institute of Technology Roorkee,
Uttarakhand-247664, India
Email: scs60fpt@iitr.ac.in

Biographical notes: Prachi Deshpande received her BE in Information Technology, ME in Computer Engineering, and PhD in Computer Engineering in 2004, 2008 and 2016 from SRTMU, Nanded-India, and Indian Institute of Technology, Roorkee-India. During her doctoral research, she was a recipient of the MHRD-India research fellowship for three years. She has authored three books and several research papers in journals and conferences of international and national repute. She is a pioneer member of the establishment of the reputed conference series ICCET of Dr. B A Technological University, Lonere-India. Her research interest includes cloud security and IDS design, big data analytics, cognitive analytics, and computer vision.

S.C. Sharma earned his PhD in Electronics and Computer Engineering in 1992 from IIT Roorkee (erstwhile University of Roorkee). He has published over 200 research papers at national and international journals/conferences and supervised 12 PhD in the area computer networking and wireless communications. He has completed several major research projects funded by agencies like AICTE, CSIR, MHRD, DST, DRDO, UKCOST. IIT-Roorkee has awarded him the Khosla annual research prize for the best research paper. He worked as a Research Scientist at FMH, Munchen, Germany. He is the honorary member of IEEE, NSBE, ISOC, and IAENG, USA. He has also worked as Group Leader (Head) of Electronics and Instrumentation Engineering Department of BITS-Pilani-Dubai Campus, from August 2003 to August 2005. Presently, he is working as a Full Professor at IIT Roorkee.

We would like to welcome you to the special issue on 'Applied computing technologies' of *International Journal of Autonomic Computing*. This issue is a collection of extended version of selected papers from ICCET-2020. This special issue of the journal thus subscribes to a broad understanding of innovation in the field of engineering and technology in order to provide a wide platform for academic and practitioner discussion. We are interested to open a discussion on how innovation may be an integral part of future trends of the research landscape worldwide. In this special issue of the *IJAC*,

the authors' disciplinary backgrounds are diverse, ranging from computing science, knowledge management engineering to digital image and signal processing.

The first contribution is reported by Meghna Goswami, Kundan Kumar and Rajeev Arya entitled as 'A comparative analysis of metaheuristic-based clustering schemes for improving the network lifetime in flying ad hoc networks'. The paper implemented a clustering methodology, which employs a hyper heuristic method for selecting optimal clusters and cluster heads using glow-worm swarm optimisation (GSO) and firefly algorithm (FA). Connectivity, distance, energy, and neighbourhood degree are the key factors considered for the optimal selection purpose.

The second contribution is the research work reported by Shantanu Jagdale, Brijesh Iyer and Sanjay Nalbalwar and Shankar Deosarkar and entitled as 'Design of high speed multistream free space optics link under clear weather conditions'. In this paper, four-channel multistream optimised high-speed wavelength division multiplexed (WDM) link with transmitter operating in O, E, L and U bands is proposed to enhance the data rate up to 40 Gbps (10 Gbps × 4 channels) for the very clear weather condition for a range of 150 km. The four-channel designed WDM system is optimised in terms of multiplexer and demultiplexer bandwidth.

The third contribution is entitled as 'Performance analysis of a 10 Gbps-60 GHz high speed RoF transmission system' and written by Deepak Jain and Brijesh Iyer of Dr. Babasaheb Ambedkar Technological University, Lonere, India. This paper investigated the performance of radio over fibre system for high-speed, moderate data of 10 Gbps encoded by RZ and NRZ code. The Mach-Zehnder modulator (MZM) is used to modulate the encoded data using 60 GHz radio frequency (RF).

'Service priority queuing model-based internet of things middleware for load balancing among fog computing centres' is reported by Dilip Rathod and Girish Chowdhary of SRTMU, Nanded, India. This research paper proposes horizontal collaborative load balancing among fog nodes in close geographical proximity. The authors use the pre-emptive priority queuing model for the processing of delay sensitive requests. The paper introduces an efficient message exchange among fog nodes to reduce computational overhead.

'Load balancing of fog computing centre and its security using elliptic curve cryptography' is reported by Yogita Pagar, Dilip Rathod and Girish Chowdhary. In this paper, a biocryptography approach using biometric key generation for elliptic curve cryptography (ECC) based on the authentication of fog computing is proposed and analysed.

The sixth contribution in the SI is reported by Mangal Banwaskar and Archana Rajurkar of MGM CoE, Nanded and entitled as 'Content-based retrieval system for surgery videos'. The paper reports a content-based video retrieval (CBVR) system is presented using average intensity, colour and shape feature that can be effectively used to find similar videos in laparoscopic video database. Experimental results revealed that mean average precision of the proposed technique is better than existing motion intensity and direction descriptor (MIDD) approach.

The seventh contribution in the SI is entitled as 'An approach towards hybrid feature selection for detection of DDoS attack' reported by Anuja Patil and Deepak Kshirsagar. In this paper, the two-step hybrid feature selection method is used. The CICIDS2017 dataset with 84 features is used for the implementation. Information gain, gain ratio, and correlation filter-based algorithms are used for the ranking of features and then the forward selection approach is used to reduce the features up to 32.

Although the various authors come from different disciplines and use different research frameworks, they all explored the topic of applied computing technologies. We hope that this special issue of the *IJAC* will benefit readers in their work, may that be research or practice, and will encourage the exchange of critical thoughts about innovation in education.