
Editorial

V. Suma

Department of Information Science & Engineering,
Dayananda Sagar College of Engineering,
Shavige Malleshwara Hills, Kumarswamy Layout,
Bangalore – 560078, India
Email: vsumadsce@gmail.com

Abul Bashar

Department of Computer Engineering,
Prince Mohammad Bin Fahd University,
Al Khobar 31952, Kingdom of Saudi Arabia
Email: abashar@pmu.edu.sa

Biographical notes: V. Suma has obtained her BE in Information Science and Technology, MS in Software Systems, and her PhD in Computer Science and Engineering. She has a vast experience of more than 17 years of teaching. She has published more than 183 international publications which include her research papers published in world class international journals such as ACM, ASQ, Crosstalk, IET Software, and international journals from Inderscience publishers, from journals released in MIT, Darmout, USA, etc. Her research results are published in NASA, UNI trier, Microsoft, CERN, IEEE, ACM portals, Springer, and so on.

Abul Bashar is currently working as Assistant Professor at Prince Mohammad University, Saudi Arabia in the College of Computer Engineering and Sciences. Earlier he completed his PhD from the School of Computing and Information Engineering at University of Ulster, UK in 2011. He received his BE degree in Electronics & Communication Engineering from Osmania University, India in 1995. He has an MS degree in Electrical Engineering from King Fahd University of Petroleum & Minerals (K.F.U.P.M.), Saudi Arabia in 1999. He is a recipient of Osmania University Engineering Gold Medal in 1995, MS Research Scholarship from KFUPM and Vice Chancellors Research Scholarship from University of Ulster. He has an extensive teaching and research experience of 18 years at various academic institutions. He has over 50 journal and conference publications, with research interests in Cloud Computing, Network Management, Machine Learning, and applications of Artificial Intelligence and Deep Learning approaches to QoS Management in Cloud/Edge Computing, IoT Security, Intelligent Robotics, Assistive technologies and Bioinformatics. He has actively served as reviewer for renowned journals and member in TPCs of prestigious international conferences.

With the rapid growth in engineering, science and technology research, the data generated due to digital applications are increasing at an unprecedented rate. This creates an imperative need to establish efficient data processing techniques to deal with the ever-

increasing data resources and derive as much knowledge from the data to make right decisions. The recent advances in data mining and big data have created a huge potential for such demands, resulting in the publication of this special issue. Data mining applications includes data analysis, algorithm design, and application areas.

With the significant capabilities of data mining approaches, there are more possible bioinformatics and biomedical applications. The primary objective of this special issue is to showcase the recent research developments on data mining techniques and their applications in bioinformatics and healthcare domains. This issue demonstrates the robustness and adaptability of computational optimisations techniques, deep learning, neural networks and classification algorithms as an effective solution for biomedical systems and control challenges. It also initiates the development of novel applications to generate new bioinformatics resources, methodologies and approaches for disease classification and identification of biomarkers and therapeutic targets.

This special issue includes seven novel research works to investigate the multifaceted dimensions of innovation, research efforts and experiences of different societies in improving the integration of advanced data mining approaches in biomedical and bioinformatics domain. The first research work, entitled 'Cuckoo search based deterministic scale (CSDS) for computer aided heart disease detection' defines a supervised learning approach with CSDS to predict heart diseases. Furthermore, the experimental study indicates the significance of the proposed model related to the detection accuracy and sensitivity along with other performance metrics. The second research work, entitled 'Infected cells of mammogram image and performance analysis using imaging techniques' has proposed the radiological image acquisition of mammogram and interpretation of cell count with image processing techniques. This research work has also given a specific focus to the calcification type, which are malignant and PLEMORPHIC in nature. Additionally, this research work has also discussed about the Region Morphometry features of area, perimeter, circularity and elongation associated with the infected area. The third research work, entitled 'CS-ABC: Cuckoo Search based adaptive boosting classifier for malaria infected erythrocyte detection' has developed a supervised learning technique that helps to detect the malaria scope in given erythrocyte. Moreover, the experimental study carried on the proposed and other contemporary models has concluded that the proposed CS-ABC is considerably significant with maximal prediction accuracy and minimal misclassification rate when compared with other contemporary models.

The fourth paper, entitled 'Adaptive bio-inspired gene optimisation based deep neural associative classification for diabetic disease diagnosis' has proposed the ABGO-DNAC to improve the classification performance for diabetic disease diagnosis at an early stage by generating association rules with a minimal number of medical attributes. The simulation results depict that the ABGO-DNAC technique is able to increase the disease prediction accuracy and also reduce the diabetic disease diagnosing as compared to state-of-the-art works. The fifth research work, entitled 'Multi spectral image classification based on deep feature extraction using deep learning technique' has combined the greedy layer-wise unsupervised pre-training with an appropriate algorithm for unsupervised learning of sparse features. This algorithm concentrates on sparse representations and sparsity of the extracted features at a time. Finally, the different spatial/spectral parameters are calculated to quantify the results.

The sixth research work, entitled 'Fusion of registered medical images using deep learning convolutional neural network with statistics based steered image filter' has

developed a novel MR and CT image fusion by utilising the deep learning convolutional neural networks (CNNs) with statistics based steered image filter (SSIF). Additionally, weighted average method is utilised to obtain the fused image. Moreover, from the experimental results, it is evident that, the proposed method has achieved promising results in terms of both visual quality and objective assessment. The seventh research work, entitled 'Visualisation of meniscus from knee joint MRI and assessment of its size differences due to age, gender and BMI' discusses about the Menisci, which play a major role in cushioning and distributing the stress due to body weight over the cartilage surface of femur and tibia. In this work, menisci were segmented from knee joint MRI using seeded region growing algorithm and volume rendered for 3D visualisation. Nevertheless, by influencing factors for size difference in menisci due to age, gender and BMI is also analysed by using statistical methods.

From the seven papers, we observe that the research community is actively engaged in exploring data mining and bioinformatics and biomedical applications. We hope that, the readers enjoy this special issue and are properly introduced to the data mining, bioinformatics and biomedical research community through these papers.