Editorial

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Biographical notes: Deepak Gupta received his PhD from Dr. APJ Abdul Kalam Technical University (AKTU), Lucknow, India, in 2017. He completed his Post-Doc from the National Institute of Telecommunications (Inatel), Brazil, in 2018. He has co-authored more than 209 journal articles, including 170 SCI papers and 45 conference articles. He has authored/edited 60 books. He has filed six Indian patents. He is the convener of the ICICC, ICDAM, ICCCN, ICIIP and DoSCI Springer conferences series. He is an Associate Editor of *Computer and Electrical Engineering*, *Expert Systems*, *Alexandria Engineering Journal* and *Intelligent Decision Technologies*. He is the recipient of the 2021 IEEE System Council Best Paper Award. He has been featured in the list of top 2% scientist/researcher databases worldwide.

Prayag Tiwari received his PhD from the University of Padova, Italy. He is currently working as an Assistant Professor in Machine Learning at the Halmstad University, Sweden. Previously, he worked as a postdoctoral researcher at the Aalto University, Finland, and Marie Curie researcher at University of Padova, Italy. He has several publications in top journals and conferences, including *Neural Networks*, *Journal of Physics A: Mathematical and Theoretical*, *Information Fusion*, *IPM*, *IJCV*, *IEEE TNNLS*, *IEEE TFS*, *IEEE TII*, *IEEE JBHI*, *IEEE TAI*, *IEEE IoTJ*, *IEEE BIBM*, *ACM TOIT*, *CIKM*, *SIGIR*, *AAAI*, *ECML*, etc. His research interests include machine learning, deep learning, quantum machine learning, NLP, healthcare and IoT.

Hamid Reza Boveiri is a faculty member of the Department of Computer Science and Engineering, Sama College, IAU, Shoushtar Branch, Shoushtar, Iran. He had been serving as the Dean of the IAU, Gotvand Branch, Iran, from 2014 up to 2016. He is currently the Head of the International Computer Science and Engineering Society (ICSES), with +30,000 members. He is an editor or reviewer for many prestigious journals, and involved in holding a number of events as member of executive or technical committees. He is the Editor-in-Chief of *ITIPPR* (ICSES), and associate editor of *International Journal of Image and Graphics* (World Scientific), *International Journal of Computer Vision and Image Processing* (IGI-Global), and *International Journal of Applied Metaheuristic Computing* (IGI-Global). His research interests include machine learning (deep neural networks), image processing and pattern recognition, scheduling and optimisation via metaheuristics, and image-guided medical interventions.

This special issue presents a set of soft computing approaches and their applications in data analytics, classification models and control. The various soft computing techniques include fuzzy logic, rough sets, neutrosophic sets, type-2 fuzzy logic, neural networks, generative adversarial networks and evolutionary computation. These are used in variety of applications, including data analytics, classification models and control.

Soft computational intelligence is a branch of computer science studying problems for which no exact algorithm exists. In other words, soft computing provides an approach to problem-solving using means other than computers. With the human mind as a role model, soft computing is

tolerant of partial truths, uncertainty, imprecision and approximation, unlike traditional computing models. The tolerance of soft computing allows researchers to approach some problems that traditional computing cannot process.

Data analytics is the science of analysing raw data to perform necessary operations and is an integral part of most businesses. Many of the techniques and processes of data analytics have been automated to various forms of algorithms that work over raw data. Raw data is the data collected from many sources, such as the internet, surveys, etc. With help of analytic processes, meaningful information may be derived from raw data for human understanding.

This special issue focuses on theoretical, mathematical tools for soft computational research and applicability in data analytics, image classification and control. From around 14 submitted articles to this particular section, five papers were selected based on the reviews. Each paper was reviewed by at least two reviewers and went through at least two rounds of reviews. The brief contributions of these papers are discussed below.

The first paper, authored by Kriti Vashistha and Anuja Bokhare and entitled 'Detection of coronary artery disease using machine learning algorithms', analyses three different algorithms, i.e., decision trees, random forests, and logistic regression, for detection of coronary artery disease. After training and evaluating of the models, the most important factors in prediction were found to be age, Trestbps, cholesterol and Oldpeak. For future work, the accuracy of the model will be enhanced.

The second paper, authored by Haribansh Mishra, Anil Kumar Pandey and Bankteshwar Tiwari and entitled 'Optimisation of target coverage in wireless sensor network using novel learning automata approach', proposes a learning automata based on a scheduling algorithm called self-adaptive minimum energy consumption algorithm (SAMECA). The SAMECA assists each sensor to choose the proper state (active or sleep) at any given time. The purpose of SAMECA is to increase the network lifetime by maximising the sleep state presence of nodes. Besides, it ensures that fewer sensors are required to cover all the targets. The results indicate that the SAMECA is a decent option to analyse all the targets by consuming less energy power.

The study in the third paper, authored by Debaleena Datta, Pradeep Kumar Mallick and Mihir Narayan Mohanty and entitled 'Classification of imbalanced hyperspectral images using ensembled kernel rotational forest', proposes a two-fold novel approach named oversampler + kernel rotation forest (O+KRoF). First, synthetic minority oversampling (SMOTE) and adaptive synthetic oversampling (ADASYN) techniques are employed on original data to balance it owing to their adaptive nature in the majority and minority samples. Finally, the ensembled KRoF classifier is applied, using a combination of unpruned classification and regression trees (CART) as its base algorithm and kernel PCA for feature reduction and most significant nonlinear spatial-spectral feature selection. Furthermore, we designed a comparison study with frequently used oversamplers and related state-of-art tree-based classifiers. However, it is found that our ensemble model is suitable and performs better than earlier works as it attains 90.92%, 97.1%, and 93.39% overall accuracies when tested on the benchmark datasets Indian Pines, Salinas Valley and Pavia University, respectively.

The fourth paper, authored by Caijun Zhang, Qianjun Wu, Jiayi Lang, Huafei Yang and Xiaolong Wang, Kaiqiang Xian and Jingqiu Zhang and entitled 'An efficient data retrieval method for grid blockchain', proposes an efficient data retrieval method for power grid blockchain (EDRM-PGB). EDRM-PGB rebuilds an efficient retrieval index structure transaction index structure (TIS) for a PG-IBS, while maintaining compatibility with the original system. Based on the structure, EDRM-PGB efficient retrieval algorithm is designed. EDRM-PGB's feasibility is verified by the prototype system implementation and performance simulation. Simulation results show that, compared with the traditional retrieval method, EDRM-PGB can greatly improve the data retrieval performance of PG-IBS. Meanwhile, it also has the advantage of sharing of index files easily.

The final paper, authored by Ritu Bibyan, Sameer Anand, Ajay Jaiswal and Anu Gupta Aggarwal and entitled 'Software reliability testing coverage model using feed-forward back propagation neural network', proposes a generalised testing coverage model by adopting different testing coverages. The authors have also compared the proposed model with existing traditional models based on three failure datasets. Different performance criteria, such as goodness of fit, accuracy of the model, mean square error (MSE), and coefficient of determination (R^2), are evaluated for the datasets. The comparison results show that the model proposed in this paper provides more efficient accuracy than the existing traditional models.

The guest editors hope that the research contributions and findings in this special issue will benefit the readers in enhancing their knowledge and encouraging them to work on various aspects of data analytics, image classification and control. We want to express our sincere thanks to the editor-in-chief for allowing us to organise this issue. The editorial office staffs are excellent, and thanks for their support. We are also grateful to all the authors who made this special issue possible, and to the reviewers for their thoughtful contributions.