EDITORIAL

Special issue on soft computing for high-dimensional data analytics and optimization

Priti Bansal[1] · Seyedali Mirjalili[2,3] · Shiping Wen[4]

With technological advancements, vast amounts of data are generated every day in various domains such as healthcare, remote sensing, financial sector, biometric, etc. Big data contains hidden information, which necessitates the development of intelligent systems to analyse the data and extract relevant information so that accurate and cost-effective decisions can be taken on time. One of the biggest challenges associated with big data analysis is high dimensionality, which is known as "the curse of dimensionality". Moreover, high-dimensional datasets tend to be in unstructured form and contain noise and uncertainties which further adds up to the challenges of big data analysis.

Soft computing techniques encompasses many methods such as artificial neural networks, evolutionary computation, metaheuristics, fuzzy systems, machine learning and chaos theory and they provide a solution to the above problems as they can deal with high-dimensional data as well as being tolerant to uncertainty, imprecision and vagueness present in the data.

Evolutionary computations algorithms effectively deal with high-dimensional big data by performing dimensionality reduction and can be effectively used during image pre-processing in medical imaging, remote sensing, and other domains for parameter optimizations during segmentation, clustering, etc. Metaheuristic algorithms are robust and problem independent so they can be applied to a wide range of problems. They can be used to improve the performance of machine learning algorithms. These properties encourage the use of soft computing methods to generate intelligent systems for high-dimensional data analysis and prediction.

This special issue is aimed at exploring soft computing techniques specially metaheuristic algorithms for high-dimensional data analytics, optimization and development of intelligent systems for prediction and decision making. We have encouraged the authors to submit papers to address the challenges associated with high-dimensional data analytics. The special issue required the authors to provide extensive literature survey and perform comparison with state-of-the-art techniques with complete statistical analysis.

There is still a long way to go and there are many challenges and advancements that have not yet been covered in this special issue. But every paper in this special issue has contributed significantly and helped in going one step ahead in solving challenges faced with high-dimensional datasets. We hope that the researchers who are looking for solution to the problems associated with high-dimensional data analytics and optimization will get benefitted by the papers published in this special issue.

The success of this special issue is due to the efforts of many people who contributed to this special issue in different roles. The guest editors would like to take this opportunity to thank all the authors for the efforts they put in the preparation of their manuscripts and for their valuable contributions. We wish to express our deepest gratitude to the reviewers, who provided instrumental and constructive feedback to the authors. We are thankful to the Editor-in-Chief and the editorial team who helped in the

✉ Priti Bansal
  priti.bansal@nsut.ac.in

  Seyedali Mirjalili
  ali.mirjalili@torrens.edu.au

  Shiping Wen
  Shiping.Wen@uts.edu.au

1 Department of Information Technology, Netaji Subhas University of Technology, New Delhi, India

2 Centre for Artificial Intelligence Research and Optimisation, Torrens University, Brisbane, Australia

3 University Research and Innovation Center, Obuda University, 1034 Budapest, Hungary

4 Australian AI Institute, Faculty of Engineering and Information Technology, University of Technology Sydney, Sydney, Australia

entire process of this special issue. Without their support, it would not have been possible to complete this special issue. Last but not the least, we would like to express our sincere gratitude to our readers of this special issue. Thank you very much to all people who are directly or indirectly involved in this special issue and we hope that in future, many such special issues will provide opportunities to researchers in this domain.