Guest Editorial Preface

Special Issue on Data Mining and Decision Sciences in Healthcare Informatics and Systems

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The data generated through the internet is a very huge amount and it contains various types of data. With the advancement of data mining and decision sciences, these fields become more interacted and popular as well as wider applications in many practices. Data mining and decision analytics areas invite researchers that utilize the latest techniques in data mining, analysis, and performance management to help decision-makers gain and sustain a competitive edge. This special Issue focuses on the mathematical aspects, modelling, storage management, computing, decisions and applications of novel techniques that further develop and apply effective data mining and decision sciences analytics tools and techniques to help decision-makers leverage the knowledge hidden within healthcare data. Data mining and decision sciences have strong foundations from decision theory and operations research to advanced statistical modelling.

This special issue aims to provide a leading opportunity for researchers, academicians, professionals and developers from different background areas to exchange the latest research ideas and synergic research and development on fundamental issues and applications about data mining and decision sciences in healthcare.

1. In the article entitled "Feature Subset Selection (FSS) in High Dimensional Clinical Data Using Mutated Binary Particle Swarm Optimization (MBPSO) with Unified Approach" by Thendral Puyalnithi and Madhuviswanatham Vankadara presented a hybrid feature selection algorithm, which uses a modified binary particle swarm optimization called mutated binary particle swarm optimization and binary genetic algorithm. The proposed MBPSO and the idea of the unification of the results of the subset reduction methods proved efficient in reducing the attribute set size without compromising accuracy on five benchmark high-dimensional clinical datasets. The proposed method is compared with other methods and the result shows the improved efficiency over other methods.
2. In the article entitled "An Intelligent Multi-Objective Framework of Pervasive Information Computing" by Basant Tiwari and Vivek Tiwari proposes a data driven multi layer architecture for pervasively remote patient monitoring that incorporates aforesaid issues. It enables the patient's care at real time and support anywhere and anytime requirement with using network infrastructure efficiently.

3. In the article entitled "The Design of a Cloud-based Clinical Decision Support System Prototype: Management of drugs intoxications in childhood by Baya Naouel Barigou, Fatiha Barigou, Chawki Benchehida, Baghdad Atmani and Ghalem Belalem developed a mobile cloud-based clinical decision support system in the field of drug poisoning in childhood. The system has Client/Server architecture and consists of a mobile application and a web service deployed on the Amazon cloud infrastructure. Physicians are provided with a user interface to introduce patients' data and receive diagnosis and treatment protocol to follow. The aim of this work is to give physicians and more particularly novices support for the treatment and monitoring of drug poisoning in case of a known or unknown toxic. For that, an intelligent system is elaborated; it consists of an expert system used when the toxic drug is known and a case-based reasoning system used otherwise.

4. In the article entitled "Comparative Analysis of Morphological Techniques for Malaria Detection by Priyadarshini Adyasha Pattanaik and Tripti Swarnkar explored a comparative experimental analysis of visual detection of infected erythrocytes malaria parasites via the most efficient morphological techniques from gold standard blood smear images. In this work, twelve different widely used morphological algorithms are evaluated followed by a random forest classifier for detecting infected erythrocytes based on their performance vis-a-vis microscopic blood smear microscopic images. Accurate detection of infected malaria erythrocytes is done using the two range of blood smear image datasets with varying malaria parasite density. Finally, compared to rest 11 morphological techniques in terms of accuracy, sensitivity, and specificity, the qualitative assessment of experimental results unveil that the Histogram method offers more meaningful and impactful findings.

5. In the article entitled "Causal Analysis of Software Development Attributes for Cloud Application Development: An illustration using Health Insurance Solution" by Nitasha Hasteer, Abhay Bansal and B. K. Murthy presented a cloud-based health insurance solution that enables consumers to purchase packages online with the objective of identifying attributes in the context of the development process while analyzing the association among the attributes. Exploratory factor analysis is used to identify the latent attributes. Their associations, in terms of causal relationship analysis, are investigated via DEMATEL, or decision-making trial and evaluation laboratory. The findings of the DEMATEL reveal that co-creative and collaborative development process, which embrace quick discovery and assembly of services in the cloud, are significant attributes that influence other attributes within the context of the cloud-based software development process.

6. The article by P. Priyanga and N C Naveen "Analysis of Machine Learning Algorithms in Health Care to Predict Heart Disease" explored a predictive analysis is made to predict the coronary heart ailment from the angiographic coronary heart ailment repute. For evaluation, authors considered 14 attributes and measures like MAE, RMSE, Precision, Recall and F-Measure metrics are calculated with the prediction time. From the analysis it is evident that SVM with linear kernel characteristic is performing better by correctly predicting the coronary heart disease compared to other ML algorithms. This proposed work is limited to historical dataset from UCI Cleveland data set, but it can be improved by using real time data set in future.

7. The article by Mehak Khurana et al., "Spiral-Phase Masked Optical Image Health Care Encryption System for medical images Based on Fast Walsh-Hadamard Transform for Security Enhancement". A new digital spiral phase masked encryption scheme is proposed for health care system based on Fast Walsh-Hadamard transform (FWHT) to enhance the security of the health-related information system. The proposed encryption system uses the brain scan image to encrypt brain information from the unauthorized access. Spiral mask used here is a hybrid of Radial Hilbert Mask (RHM) and Toroidal Zone Plate (TZP) Mask which makes the key strong and enhances the security. Proposed scheme not only increases the key space but also increases the number of parameters which makes it difficult for an attacker to find exact key to

recover original image. Another advantage of this proposed scheme is FWHT which reduces the quantization error that helps in reconstructing the brain image and information perfectly.

We would like to express our gratitude and appreciation to the authors of the papers, for their ardent efforts and involvement in the special issue publication. We are grateful to the promptness and commitment of the reviewers for their valuable evaluations, to significantly enhance the quality of papers. Additionally, we extend our thanks to all the staff members of IGI Global publications for their continuous effort and dedication for publishing this special issue on "Data Mining and Decision Sciences in Healthcare Informatics and Systems". We particularly appreciate the fortitude and relentless support granted to us by Prof. Joseph Tan, Editor-in-Chief of the International Journal of Healthcare Information Systems and Informatics.

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