



Multimedia medical data-driven decision making

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The data-driven decision-making solutions have become more demandable in healthcare for development, testing, and trials; it has intended to be a part of both hospitals and homes. This special issue presents valuable perceptions to researchers and engineers on designing robust multimedia medical data analytics systems and improving patient information delivery care remotely. End-to-end health data delivery involves the development of multiple technologies that should enable reliable and faster communication between a patient and a medical provider.

This large volume of health data, often called big data, cannot readily be processed by traditional data processing algorithms and applications. By intelligently investigating and collecting large amounts of healthcare data, Image analysis associated with the Internet of Medical Things can enhance the decision-making process and early disease diagnosis. Hence, there is a need for scalable machine learning; deep learning and intelligent algorithms lead to more interoperable solutions and effective decisions in emerging medical data-driven solutions. In line with these efforts, the central theme of this Special Issue is to report novel methodologies, theories, technologies, techniques, and solutions for medical data analytics techniques for multimedia applications.

This special issue would focus on recent advances and different research areas in healthcare technologies, medical imaging and signal processing, computational Intelligence and Bioinformatics, security and data analysis under the intelligent decision-making framework and would also seek out theoretical, methodological, well-established and validated empirical work dealing with these different topics. The title covers a vast audience from basic science to engineering and technology experts and learners. This special issue aims at bringing together

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the latest industrial and academic progress, research, and development efforts within the rapidly maturing decision-making data analytics ecosystem.

With all this in mind, this special issue is meant to address these topics across multiple abstraction levels, including novel data models for efficient storage and processing of big medical data, mechanisms, and algorithms for predictive and preventive healthcare, security, and privacy measures for protecting sensitive data of patients, decision-making systems, etc.

In this Special Issue, fifteen manuscripts are published directly or indirectly relating AI-enabled multimedia medical decision-making systems for patient monitoring with intelligent interfacing and implementation techniques.

The first paper by Sharma et al. presents a breast cancer prediction method from microRNA profiling. This paper proposes to use a random subspace ensemble of LDA classifiers. The outcomes indicate that the approach is superior to the LDA in terms of different efficiency indicators.

The second paper by Viswanath et al. designs a deep learning reaction-diffusion level set segmentation technique for healthcare related to automatic kidney stone detection.

The third paper by Saim et al. presents the combination of curcumin and Infrared Hyperthermia therapy as an alternative to chemotherapy in breast cancer treatment. Infrared Hyperthermia therapy is a non-contacting method that elevates body temperature and treats malignant lesions such as breast cancer.

The fourth paper by Gupta et al. presents a registration-based calibration method used to perform linear measurements on posteroanterior cephalograms.

The fifth paper by Kumar et al. presents various types of deep-learning techniques for predicting postpartum hemorrhage.

The sixth paper by Ahmed et al. proposes institutional data collaboration alongside an adversarial evasion method to keep the data secure. The model uses a federated learning approach to share model weights and gradients.

The seventh paper by Mahapatra et al. presents an automatic vessel segmentation technique. This approach enhances image contrast and highlights the edges using a novel cascaded pre-processing stage.

The eighth paper by Saudagar et al. presents a practical method for integrating learning system advantages with a decision logic framework using an image compression hybrid model.

The ninth paper by Garg et al. presents regional coherence among the BOLD fMRI voxels belonging to the individual region of the brain, which has some correlation with underlying pathology as well as cognitive performance. This fact can suggest potential biomarkers to the early onset of the disease.

The tenth paper by Tan et al. presents image segmentation and interpolation to achieve better performance in MR image processing.

The eleventh paper by Jena et al. focuses on lowering the active involvement of COVID-19 warriors in treating high asymptomatic COVID-19-infected (HACI) patients for handling this challenging situation. This paper considers HACI and low asymptomatic COVID-19-infected (LACI) patients.

The twelfth paper by Wang et al. presents a multimedia medical management method supported by data-driven intelligent decisions. This method can predict cancer patients' survival time with the help of a gradient-boosting decision tree and a hybrid neural network model.

The thirteenth paper by Patri et al. presents how to efficiently harvest energy and improve network throughput so that the narrowband user equipment has a longer life span instead of replacing batteries every few years to keep them working.

The fourteenth paper by Dash et al. presents a technique for the auto-detection of epileptic seizures using an online surface EEG database.

The final paper by Prabhaker et al. presents AI-based multi-objective evolutionary algorithmic techniques such as multi-objective genetic algorithm, non-dominated sorting genetic algorithm, and multi-objective messy genetic algorithm for real-time scheduling tasks to a multicore processor-based low-power biomedical device used for health care application.

All fifteen papers tackle different but highly relevant domain vectors of Artificial Intelligence in multimedia Healthcare. We believe this Special Issue will raise awareness in the scientific community, by presenting and highlighting the advances and latest novel and emergent technologies, implementations, applications concerning the sensing psychological parameters and patient monitoring. In closing, we thank all the authors who submitted their research work to this special issue. We would also like to acknowledge the contribution of many experts in the field who have participated in the review process and provided helpful suggestions to the authors to improve the contents and presentations of the articles. We would particularly like to thank Professor Borko Furht, the Editor-in-Chief, and the publishing team for their support and helpful suggestions and comments during the delicate stages of concluding the special issue.

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