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Preface to Special Issue on Scientific Computing and Learning Analytics for Smart Healthcare Systems (Part II)

This special issue introduces emerging intelligent healthcare technologies that incorporate big medical data, artificial intelligence, scientific computing, federated learning, bio-inspired computation, the Internet of Medical Things, security and privacy, semantic databases, etc. Health monitoring and diagnosis for the target structure of interest are achieved through the interpretation of collected data. Advances in sensor technologies and data acquisition tools have led to a new era of big data, where massive amounts of medical data are collected by different sensors. This special issue offers valuable insights to researchers and engineers on designing intelligent bio-inspired Health 4.0 technologies and improving remote patient information delivery and care. By intelligently investigating and collecting large amounts of healthcare data (i.e., big data), sensors can enhance the decision-making process and help in early disease diagnosis. Hence, scalable machine learning, deep learning, and intelligent algorithms are needed to develop more interoperable solutions and make effective decisions in emerging sensor technologies. Optimization algorithms can be applied to acquire sensor data from multiple sources for fast and accurate health monitoring. In this special issue, seven manuscripts are published. The papers are directly or indirectly related to advanced clustering, imaging, and computing for bio-signal acquisition systems with intelligent computing.

As follows, we briefly review the main contributions of each manuscript.

Raman *et al.* [1] present a semantic web technique for clinical topic identification in healthcare. By combining the characteristics of clinical topic timing and short text semantic similarity, a topic detection and tracking system method based on clinical clustering is proposed.

Geetha *et al.* [2] discuss a framework that is intended to monitor blood glucose levels of diabetic patients, providing accurate guidance and support in terms of diet, insulin intake, exercise, etc. A CGM sensor is considered for measuring blood glucose levels of diabetic patients from interstitial fluid to avoid frequent finger pricks.

Pallathadka *et al.* [3] present an artificial intelligence-based method for detecting Parkinson's disease. As input, images of patients' handwriting are used in this method.

Victor *et al.* [4] consider data leakage detection systems to identify when a distributor's (owner of the data) sensitive and important data has been leaked by malicious agents (e.g., third parties with whom the data is shared) and to determine the agents responsible for the data breach.

Raziq *et al.* [5] present a lightweight hybrid cryptography algorithm using cryptographic-based techniques for WBAN networks to improve network security, minimize network overhead and delay issues, and improve healthcare monitoring processes.

Ramakrishna and Ramasangu [6] discuss an efficient classification framework based on hierarchical consensus clustering and split time series. Their paper proposes a classification algorithm that selects the best stable feature (voxels) from the given dataset. The algorithm reduces computational costs in cognitive state classification by choosing the minimum number of voxels.

Avila Clemenshia P. and Deepa C. [7] focus on identifying a very efficient and accurate machine-learning algorithm to categorize human cancer subtypes based on gene expression data in cancer cells. These issues can be addressed using machine-learning algorithms such as Transductive Support Vector Machines, Boosting Cascade Deep Forest, Enhanced Neural Network Classifier, Deep Flexible Neural Forest, Convolutional Neural Network, and Cascade Flexible Neural Forest.

All the papers tackle different but highly relevant topics within the domain of health data acquisition. We believe this special issue will raise awareness in the scientific community by presenting and highlighting advances, latest novel and emerging technologies, implementations, and applications concerning the sensing, classification, and analytics of health parameters and patient monitoring. In closing, we thank all the authors who submitted their research work to this issue. We would also like to acknowledge the contribution of many experts who participated in the review process and provided helpful suggestions to improve the content and presentation of the articles. Additionally, we would like to thank the publishing team for their support, helpful suggestions, and comments during the various intricate stages of publishing this special issue.

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