

IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS

J-BHI Special Issue on “Generative Artificial Intelligence Driven Smart Healthcare”

The recent years have witnessed the dramatic popularity of using artificial intelligence (AI) for medicine and healthcare. The most popular applications are generally prediction techniques, they employ amounts of clinical or healthcare-related data for training the algorithms which are then used for making smart diagnosis of a new input. Such a pattern currently suffers from great challenges most of which come from the training data. Typical difficulties include the in-sufficient data for model training, the data imbalance, and the biases of the training samples. The AI-driven diagnostic tools relying on historical biased and in-sufficient data would fail when deployed in settings different from where the trained data was acquired. Large datasets that are diverse and representative are in high demand for improving the robustness of the AI-based smart healthcare applications. The generative AI (GenAI) paradigm is a promising solution. The GenAI refers to AI techniques that enable using existing content like text or images to create new contents. It is able to abstract the deep dependencies and distributions in the real data sets, and ensures novel and higher-quality outputs by self-learning rather than a replication, while also preserves the patient privacy. Primitive attempts have been done to explore GenAI for promoting the AI-based smart healthcare, such as the GAN-based data augmentation to increase the training sample for the medical image/data pattern recognition tasks. However, huge potentials are waiting to be explored and some emerging challenges need to be addressed, such as the problems of cross-model synthesis, evaluation metrics of the synthetic data, smart healthcare applications, information security, and so on.

This special issue aims to solicit the high-quality research submissions and review papers, which focus on *Generative Artificial Intelligence Driven Smart Healthcare*, specifically on design, theory, modelling, data analysis, and applications of using GenAI for smart medicine and healthcare. State-of-the-art achievements from both the academic and industrial communities are welcome. The topics of interest include, but are not limited to:

- Novel GenAI algorithms
- GenAI for text-to-image synthesis
- GenAI for medical image processing
- GenAI for electronic health records processing
- GenAI for cross-model data synthesis
- GenAI for medical data augmentation
- GenAI for medical big data analysis
- Evaluation metrics for GenAI-based synthetic samples
- Optimization for training GenAI models
- Security and privacy in GenAI

Guest Editors

Junxin Chen, Northeastern University, Shenyang, China, junxinchen@ieee.org

Zhihan Lv, Uppsala University, Uppsala, Sweden, lvzhihan@gmail.com

Danda B. Rawat, Howard University, Washington DC, USA, db.rawat@ieee.org

Haider Abbas, National University of Sciences and Technology (NUST), Pakistan, haidera@kth.se

Key Dates

Deadline for Submission: 31 Dec, 2022

First Reviews Due: 28 Feb, 2023

Revised Manuscript Due: 15 April, 2023

Final Decision: 31 May, 2023

