IEEE JOURNAL OF

**BIOMEDICAL AND HEALTH INFORMATICS**

# HI Special Issue on “AI-powered models and digital twins for personalized healthcare”

Artificial Intelligence (AI) is gradually changing the routine of medical practice, and the level of acceptance by the medical personnel is constantly increasing. Recent progress in digital medical data acquisition through advanced biosignal and medical imaging devices, machine learning and high-performance cloud computing infrastructures, push health-related AI applications into areas that were previously thought to be only the province of human experts. Such applications employ a variety of methodologies, including fuzzy logic, evolutionary computing, neural networks, or deep learning for producing AI-powered models that simulate human physiology; often called digital twins. In this context, digital twins can also be used t modeling an individual’s genomic makeup, physiological characteristics, and lifestyle to deliver personalized medicine. It is an ambitious paradigm looking at the human in an end-to-end approach, across all scales, unifying the virtual physiological human and the daily health behavior models and technologies. This approach is anticipated to disrupt clinical practice, since it offers a more individual focus than precision medicine, which typically involves specific groups within a greater population. Furthermore, twinning the human body can support medical diagnostics, follow-up monitoring, preventive medicine, therapy assessment, and many other domains.

This Special Issue will focus on research targeting at the development of such AI-powered models and digital twins for personalized healthcare. The issue will follow the organization of the 2nd Artificial Intelligence in Biomedical Engineering and Informatics WORKSHOP to be held within the 18th AIAI 2022 Artificial Intelligence Applications and Innovations conference. The special issue will be comprised of extensions of some of the best works announced in the workshop, along with papers submitted within the open call, taking also into account the target audience of the JBHI journal.

Topics of interest include, but are not limited to, the following:

# • Wearable Systems and Quantified-Self technologies for collecting digital twin data

# • Medical and Sensor Data analysis and transformation for AI-based modelling

# • Machine Learning for twinning the human body

# • Medical Image Analysis and Radiomics - Integrating radiomics with multi-omics and AI

# • Intelligent Data Processing and Predictive Algorithms for Digital Twins

# • Assistive Environments and Coaching based on Digital Twins

# • Cloud and Edge Computing Technologies enabling for Digital Twins

# • Security, Safety and Privacy aspects of Digital Twinning

# Guest Editors

Spyrettta Golemati, University of Athens, sgolemati@med.uoa.gr

Ilias Maglogiannis, University of Piraeus, imaglo@unipi.gr

Ioanna G. Chouvarda, Aristotle University of Thessaloniki, ioannach@auth.gr

Andreas Panayides, 3AE Health LTD (3AHealth), panayides@cs.ucy.ac.cy

# Key Dates

Deadline for Submission: 31 Aug, 2022 First Reviews Due: 05 Oct, 2022 Revised Manuscript Due: 01 Nov, 2022

Final Decision: 01 Dec, 2022

