J-BHI Special Issue on

"Enabling Technologies in Health Engineering and Informatics for the New Revolution of Healthcare 4.0"

Powered by the technologies originated from manufacturing industries driven by the fourth revolution of industry (Industry 4.0), the fourth revolution in healthcare technologies (Healthcare 4.0) is also emerging. In the context of Healthcare 4.0, vast amount of cyber and physical systems (CPS) are closely combined through the Internet of Things (IoT), intelligent sensing, big data analytics, artificial intelligence (AI), cloud computing, automatic control, and autonomous execution and robotics to create not only digitized healthcare products and technologies, but also digitized healthcare services and enterprises. Driven by these mega trends, Health Engineering (i.e. the applications of engineering principles and efficient and economical approaches to solve problems in healthcare and well-being) is emerging as a new interdisciplinary field of research and development. Health Engineering will lead to a revolutionized healthcare system that enables the participation of all people for the early prediction and prevention of diseases so that preemptive and pro-active treatment can be delivered to realize personalized, precision, pervasive, and patient-centralized healthcare.

However, significant challenges can be foreseen in this emerging interdisciplinary field: the reliability and latency issues of high speed data communication and network technology in healthcare; the acceptance of healthcare robotics applications in clinical practice; the feasibility of AI's application in health data analysis, disease diagnoses and treatments; the human safety issue during human-robot interaction, in particular, in the uncertain and dynamic environments; and the corresponding legal issues.

The goal of this special section is to publish the latest research advancements in the convergence of automation technology, artificial intelligence, biomedical engineering and health informatics. The applications can cover single or multiple scenarios of health engineering such as primary care, preventive care, predictive technologies, wearable technologies, hospitalization, home care, and occupational health. We focus on the cross disciplinary approaches, solutions, and initiatives rather than single disciplinary ones. Topics include but are not limited to:

- New design paradigms, methodologies, and services models of the Health Engineering
- Healthcare Cyber Physical Systems for the Healthcare 4.0
- Healthcare Internet of Things for the Healthcare 4.0
- Healthcare Big Data for the Healthcare 4.0
- Industrial Wireless Sensor Networks, 5G, high reliability and low latency communications for Healthcare 4.0
- Healthcare Robotics and Robotic Informatics for the Healthcare 4.0
- Human-Robot Interfaces, Interactions, and Symbiosis for the Healthcare 4.0
- Machine Learning and Artificial Intelligence in Biomedical Equipment, Disease Diagnoses and Treatments for the Healthcare 4.0
- Modelling, Scheduling and Optimization of Healthcare Processes for the Healthcare 4.0
- Digitization of Healthcare Enterprises and Systems for the Healthcare 4.0
- Digital Twins for Complex Medical Equipment and Systems for the Healthcare 4.0
- Flexible, Wearable and Implantable Biomedical Devices for prognosis, diagnosis, treatment, and medication

Guest Editors

•Geng Yang (yanggeng@zju.edu.cn), School of Mechanical Engineering, Zhejiang University, Hangzhou, China.
•Zhibo Pang (pang.zhibo@se.abb.com), ABB Corporate Research, Vasteras, Sweden.
•Amir M. Rahmani (amirr1@uci.edu), Center for Embedded and Cyber-Physical Systems (CECS), University of California, Irvine, USA.
•Mianxiong Dong (mx.dong@csse.muroran-it.ac.jp), Department of Information and Electronic Engineering at the Muroran Institute of Technology, Japan.
•Yuan-Ting Zhang (yt.zhang@cityu.edu.hk), Department of Mechanical and Biomedical Engineering, City University of Hong Kong.
•M. Jamal Deen (jamal@mcmaster.ca), Electrical and Computer Engineering, McMaster University, Hamilton, Ontario, Canada.
•Nigel Lovell (n.lovell@unsw.edu.au) Scientia Professor at the Graduate School of Biomedical Engineering, UNSW Sydney, Australia

Key Dates

Deadline for Submission: 30 Sept, 2019
First Reviews Due: 30 Oct, 2019
Revised Manuscript Due: 31 Dec, 2019
Final Decision: 29 Feb, 2020