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J-B HI Special Issue on

“The role of Digital Twin in Healthcare: Current Trends and Challenges”

Frontier technologies are accelerating the creation of super-advanced "virtual twins". Which open to data-driven models capable of preventing disease and offering more efficient health systems. Digital twins are digital representations of human physiology built on computer models - in silico - in which data relating to both the individual and the population are introduced. The use of digital twins in healthcare is revolutionizing clinical processes and hospital management by enhancing medical care with digital tracking and advancing modelling of the human body. These tools are of great help to researchers in studying diseases, new drugs and medical devices. In the future may also help physicians optimize the performance of patient-specific treatment plans. In the short term, however, digital twins will help the healthcare system bring life-saving innovations to market faster, at lower costs and with greater safety for the patient. For example, it is realistic to think of "digital twins" of organs such as the heart, or even single cells, for individual patients. Simulations can then be performed to find out how different people would react to different treatments. But digital twin technology can also be used to represent the genome, physiological characteristics and lifestyle of an individual to personalize medicine fully. A digital twin of a human body can allow doctors to discover the pathology before the disorders are evident, experiment with treatments and better prepare for surgery. However, the key to translating digital twins' value into real impact lies in large-scale implementation: making the technology widely accessible in the clinical routine, innovating key clinical processes using digital simulations, and improving medical care. The goals of this special issue are to facilitate advancements and knowledge dissemination in methodologies and applications of Digital Twin in the healthcare and medicine fields, raising interest and awareness in the research community.

Topics of interest include, but are not limited to:

- Digital Twins theory and modelling
- Digital Twins enabling technologies, including artificial intelligence, sensors, cloud, and edge computing
- Digital Twins blueprint
- Digital Twins standardization
- Digital Twins experience from concrete applications
- Digital Twins role in the digital transformation process
- Overlapping of Physical and Digital Twins
- Personal Digital Twins
- Cognitive Digital Twins
- Societal and ethical aspects

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