Journal of Ambient Intelligence and Humanized Computing

Special Issue on Bio-medical Signal Processing for Smarter Mobile Healthcare using Big Data Analytics

With the technological advancements, quality of human health measurements has reached to a new realm. Medical devices are routinely used to detect and record physiological signals that are essential for human health monitoring. Health monitoring and sensing devices are ranging from thermometers, heart rate monitors, blood oxygen monitors, and EEG recorders to ultrasound and MRI machines. Further, with the increase in human population, the data generated in hospitals and other health concerned places rapidly growing. However, the processing of huge amount of data generated from various sources such as Body Area Network (BAN), IoT-enabled health devices such as blood pressure and sugar monitoring devices, etc. is becoming an alarming issue in near future. Nevertheless, current health monitoring systems can be further improved by facilitating real-time signal measurements, modeling, and processing using Hadoop ecosystem, SPARK, GraphX and other data analytical tools. However, the existing advancements significantly influence the early diagnosis of a disease or disorder, while empowering preventive care practices, drug administration processes, and rehabilitation of physically disabled people. Moreover, noise filtration is demanded the betterment of bio-signal processing to determine dynamic models to understand the characteristics and behaviors that provide prominent features in detecting abnormalities within those signals.

In the last decade, a significant development has been made in the area of medical signal processing measurement techniques, e-health monitoring through body area networking, medical assisted rehabilitation, and remote clinical diagnosis. However, integrating health services with the existing communication technology and performing remote health treatments with accuracy and precision is still challenging job. Therefore, it is necessary to analyze the existing data using various data analytics techniques and tools such as Hadoop ecosystem etc. The development of sensors technology that can accurately measure the bio-signals generated from a patient body in various forms and diagnosis different diseases based on these signals revolutionized the new era of modern health techniques. These concepts can be used in future in minimizing the doctors’ efforts and telemedicine activities. However, still sophisticated and dynamic medical techniques and approaches are needed to overcome the challenges present in the current research. The goal of this special issue is to provide a forum for the research activities currently going on in the above fields and also developing and designing techniques for efficient sensing, processing, and analyzing the patient health conditions based on the bio-signal processing. In addition, novel mechanisms and algorithms are needed to overcome the deficiencies present in the current models for EEG, ECG, and MEG signals. Further, the data generated from various health services, such as hospitals, clinics, etc. is in huge and enormous form. Therefore, it is difficult to present a dynamic and autonomous system based on the conventional data analysis techniques. Therefore, a solution and system is needed which efficiently analyze and process data in real-time. Similarly, autonomous system can build on top of the hospital services to provide first-aid activities in various environments such as disasters, accidents, etc.

The topics of interest are:
- Signal processing techniques for geriatric disease assessment using Big Data analytics
- Analysis of Big Signal Data using Hadoop ecosystem
- Sensing and data gathering techniques of bio-signals via WSN
- Analysis and processing of Bio-signal Dataset
- Application of BAN in data generation and analysis
- Techniques to analyze brain signals using existing techniques and datasets
- E-health monitoring using bio-signals in real-time using SPARK, GraphX, etc.
- Design architecture for IoT-enabled health activity monitoring devices
- Medical signal processing using digital signal processing techniques
- Designing advanced telemedicine techniques based existing telemedicine data
- Analysis of various diseases such as Aphasia, etc. using bio-signal processing
- Advance techniques to measure EEG, ECG, etc. signals
- Designing of embedded devices for smart health

**Timeline and Process:**
- Manuscript due: April 1, 2018
- Acceptance/rejection notification: June 1, 2018
- 2nd round check: August 1, 2018
- Final manuscript due: October 1, 2018

All the papers for this special issue will go through the online submission system and the standard peer review process of the Journal of Ambient Intelligence and Humanized Computing. Detailed guidelines for submission of the papers are kindly referred to “Instructions for Authors” of Journal of Ambient Intelligence and Humanized Computing (http://www.springer.com/engineering/computational+intelligence+and+complexity/journal/12652).

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Prior to sending full paper submissions, it is highly recommended to query the appropriateness of submissions with a 100-200 word abstract by contacting the guest editor with the following contact information: Gwanggil Jeon, Incheon National University, Korea, gjeon@inu.ac.kr