Tentative Outline

Special Thematic Issue for the journal Recent Advances in Computer Science and Communications

Title of the Thematic Issue: "Classification of Physiological Signals for Medical Diagnostics and Biometrics Applications"

Guest Editors: Dr. Ranjeet Srivastva and Dr. Yogendra Narain Singh

- **Scope of the Thematic Issue:**

Physiological signals are produced by the physiological process of human beings. The physiological signal can be measured and monitored during their generation and functioning of physiological organ or a tissue. For example, in the human body many physiological organs generate physiological signals. These signals are produced by the difference of electrical potential across a specific organ. For example, electrocardiogram (ECG), electroencephalogram (EEG), electromyogram (EMG), electrooculography (EOG), mechanomyogram (MMG) and galvanic skin response (GSR) are physiological signals. Physiological signals are mostly employed for medical diagnostics. Recent research has revealed that physiological signals, especially ECG can be used as a biometric modality for human recognition. The studies have shown that the physiological signals possess the characteristics that are unique to individuals. Other benefits of using physiological or bioelectric signals for human recognition are their universality, measurability, uniqueness, and resistance to fraudulent attacks. These signals have innate energy that denotes life signs.

This Special Issue will explore various uses of physiological signals and will also provide an overview of recent breakthroughs in medical diagnostics and biometrics. Contributions relating to novel sensor technology and electronic devices, as well as novel sampling paradigms such as compressive sensing, which includes compression of physiological signals, are also encouraged. Signal preparation is required for the subsequent phases of processing to function successfully. This Special Issue welcomes papers that use long- or short-term recordings to aid clinical decision-making or human identification. It may include the possible approaches that employ probability theory, Bayes inference, machine learning or deep learning methods for the detection and classification.

Keywords: Physiological Signals, Medical diagnostics, Human Identification, Intelligent Systems, Signal Processing, Image Processing, Pattern Classification.

Sub-topics:

The topics of interest are broad, including but not limited to the related sub-topics listed below:

- Physiological signal processing for medical diagnostics and biometrics applications
- Image processing for medical diagnostics and biometrics applications
- Physiological signal pattern analysis and classification for identifying various diseases.
- Physiological signal pattern analysis and classification for user authentication and identification
- Inter-sensor analysis of physiological signals
- Physiological signal variability analysis
- Physiological signal/ image data augmentation
- Physiological signal pattern analysis and classification application such as gender and age recognition

- Physiological signal applications using computational intelligence, machine learning or deep learning
- Pathological decision-making systems using physiological signal
- Intelligent healthcare system

Tentative titles of the articles:

- An Intelligent Healthcare System for Fetal Arrhythmia Classification
- A Novel Medical Image Denoising Technique using Deep Neural Networks
- Electrocardiogram Signal Analysis for Age Prediction and Gender Recognition
- Heartbeat Pattern and Arrhythmia Classification: A Review
- A Critical Review on Feasibility of Physiological Signals for Human Recognition
- Multimodal Medical Image Fusion for Abdominal Disease Detection
- A Review on Deep Learning Techniques used in Physiological Signal Analysis for Disease Detection
- ECG based Gender Recognition using Ensemble of Deep Neural Networks
- Studying Inter-Sensor operability of Physiological Signal for Medical Diagnostics
- Evaluating the Role of Fuzzy Decision Models used for Medical Data Analysis
- Soft Biometrics Retrieval System based on Physiological Signals
- Hybrid Fluorescence Medicated Tomography based Bio distribution Assessment
- Combating Data Insufficiency in Medical Image Diagnostics
- Multidimensional Polynomial Splines for Physiological Signal Processing

Schedule:
- Paper submission: June 30, 2022
- Review results to authors: September, 30, 2022
- Revised paper submission: November 30, 2022
- Final acceptance notification: December 31, 2022

Contacts:

1. *Guest Editor Name:* Dr. Ranjeet Srivastva
    Affiliation: Department of Information Technology, Babu Banarasi Das Northern India Institute of Technology, Lucknow, Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, India.
    Emails: ranjeetbbdit@gmail.com, ranjeetbbdit@bbdniit.ac.in

2. *Guest Editor Name:* Dr. Y. N. Singh
    Affiliation: Department of Computer Science and Engineering, Institute of Engineering and Technology Lucknow, Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, India.
    Emails: singhyn@gmail.com, singhyn@ietlucknow.ac.in