<p style="text-align:center">**SPECIAL SESSION ON**</p>

<p style="text-align:center">**Signal Processing and Artificial intelligence methods for Bioinformatics, computational biology and Biostatistics**</p>

Session Co-Chairs:

- Imen Messaoudi, Assistant professor, University of Carthage, imen.messaoudi@enit.rnu.tn

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- Zied Lachiri, Professor, University of Tunis El Manar, Zied.lachiri@enit.utm.tn

Session description:

Continuous advances in genomes sequencing are serving to discover genes and proteins involved in the pathogenesis of diseases. The functional understanding of disease represents, subsequently, the driving element of molecular-based diagnosis and prognosis development. Thereby, by characterizing the genomic and proteomic regulation, systems-based medical solutions can be offered. Nowadays, researchers are increasingly moving toward defining personalized models to identify individually tailored drugs and therapies. Given that in this framework many tasks are challenging, different computational techniques and modeling systems are proposed to help solve existing problems. However, modeling and simulating life systems mostly involve a huge amount of biodata (e.g. gene expression profiles, genomic and protein sequence data, protein structure, protein interactions, clinical data, etc...). In order to utilize information held by these data, more robust methods such as the Genomic Signal Processing (GSP) and the Artificial Intelligence (IA) approaches are needed. Indeed, Deep Learning (DL) and Machine Learning (ML) are reporting a wide range of modeling techniques with the potential to result in ground-breaking medical applications.

The purpose of this special session is to bring together researchers involved in the development of methods in GSP and IA to the genomics/proteomics and computational biology fields.

Topics of interest include, but are not limited to:

- Signal processing for genomic data visualization
- Blind/statistical signal processing for bioinformatics applications
- Transform domain and subspace techniques – advanced classification and clustering for genomic/proteomic data
- Signal processing for gene expression, microarray data analysis and disease classification
- Signal processing methods for Phylogeny
- Theory and software for modeling and simulating genomic data
- Computational Intelligence and Data Mining in Bioinformatics
- Artificial Intelligence in Proteomics and protein structure, location, and function prediction
- Machine learning and Deep learning methods applied to genetics and epigenomics datasets, to understand the conditions of healthy and/or sick patients
- Machine learning software and tools applied to biological datasets to understand the underlying biomolecular scenario

Dr. Imen Messaoudi

Received her PhD degree in electrical engineering from the National Engineering School of Tunisia (ENIT). She is Assistant professor at the Higher Institute of Information Technologies and Communications (ISTIC) in the Industrial Computing Department. Her research interest includes biomedical and genomic signal processing, image processing and pattern recognition. She is a member of the research laboratory: Signal, Image and Information Technology (SITI) of the National Engineering School of Tunisia (ENIT). She served as reviewer for many conferences and impacted international journals.

Dr. Afef Elloumi Oueslati

PhD in electrical engineering from the National Engineering School of Tunisia (ENIT). She is Associate Professor at the National School of Engineers of Carthage (ENICarthage). Her research interest includes issues related to signal and image processing applied on biomedical and genomic fields. She proposed many special sessions in conferences and served as reviewer for many impacted international journals.

Pr. Zied Lachiri

PhD in electrical engineering from the National Engineering School of Tunisia (ENIT). He is Professor and Research Director of the Signal, Image and Information Technology laboratory (LR-SITI) at the National Engineering School of Tunisia (ENIT). His research interests include pattern recognition, signal and image processing in biomedical, multimedia and machine communication.