

## Biomedical Signal Analysis: A Probe to detect Structure-To-Function Paradigm

Biomedical signals carry important information about the behavior of the living systems under studying. A proper processing of these signals allows in many instances to obtain useful physiological and clinical information traditional stationary signal analysis together with innovative methods of investigation of dynamical properties of biological systems and signals in second-order or in higher-order approaches provide a wide variety of even complex processing tools for information enhancement procedures. Another important innovative aspect is constituted by the integration between signal processing and modeling of the relevant biological systems which is capable to directly attribute patho-physiological meaning to the parameters obtained from the processing and viceversa the modeling fitting could certainly be improved by taking into account the results from the signal processing procedure. Such an integration process could comprehend parameters and observations detected at different scales, at different organs and with different modalities. This approach is reputed promising for obtaining innovative information about the complexity of the physiological system structure and its relationship with the complexity of its function: hence, an olistic view of the patient is obtained rather than an atomistic one which considers the whole as a simple sum of the single component parts.