Entropy

an Open Access Journal by MDPI

CiteScore: 5.2
Indexed in PubMed
Impact Factor: 2.0

Special Issue Reprint

Assessing Complexity in Physiological Systems through Biomedical Signals Analysis II

Edited by: Paolo Castiglioni, Luca Faes, Gaetano Valenza and Andrea Faini

Most physiological systems behave like complex, adaptive structures. In physiology and medicine, this complexity reflects the capacity of living systems to maintain homeostasis while responding to internal and external challenges, arising from features such as fractal- and self-organization, nonlinear dynamics, and the coordinated activity of interdependent components operating across multiple hierarchical levels and time scales. Biomedical signals encode aspects of this complexity, supporting the identification of physiological states, long-term health monitoring, and the anticipation of pathological events. As a result, contemporary research has focused on methods capable of characterizing system complexity in time series derived from continuous electroencephalogram and electromyogram recordings, cardiovascular beat-by-beat measurements, respiratory patterns, and other physiological variables. Despite substantial progress, key methodological challenges remain, including differentiating complexity from randomness, ensuring robust estimation from short or multivariate recordings, integrating multivariate measures of predictability, entropy, and fractality, and describing the underlying stochastic processes. This Reprint is the second volume in its series, following the initial *Entropy* Special Issue printed in 2021. Building on the significant interest generated by that collection, this volume presents recent studies which aimed to enhance the applications of complexity-based methods in physiological and clinical contexts.

https://www.mdpi.com/books/reprint/12315