Special Issue Reprint

Multiscale Entropy Approaches and Their Applications

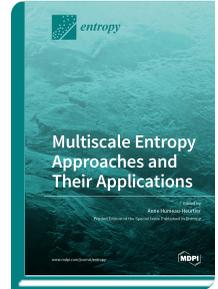Edited By:
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Multiscale entropy (MSE) measures to evaluate the complexity of time series by taking into account the multiple time scales in physical systems were proposed in the early 2000s. Since then, these approaches have received a great deal of attention and have been used in a wide range of applications. Multivariate approaches have also been developed. The algorithms for an MSE approach are composed of two main steps: (i) a coarse-graining procedure to represent the system's dynamics on different scales and (ii) the entropy computation for the original signal and for the coarse-grained time series to evaluate the irregularity for each scale. Moreover, different entropy measures have been associated with the coarse-graining approach, each one having its advantages and drawbacks. In this Special Issue, we gathered 24 papers focusing on either the theory or applications of MSE approaches. These papers can be divided into two groups: papers that propose new developments in entropy-based measures or improve the understanding of existing ones (9 papers) and papers that propose new applications of existing entropy-based measures (14 papers). Moreover, one paper presents a review of cross-entropy methods and their multiscale approaches.

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