Jose Amigó
Universidad Miguel Hernandez (Spain)
e-mail: `jm.amigo@umh.es`

An overview of permutation entropy

Permutation entropy was introduced in 2002 by Bandt and Pompe as a complexity measure for time series. Roughly speaking, permutation entropy replaces the probabilities of length-L symbol blocks in the definition of Shannons entropy by the probabilities of length-L ordinal patterns, each pattern being a digest of the ups and downs of L consecutive elements of a time series. Since then permutation entropy itself, along with different tools based on ordinal patterns, have found a number of interesting applications. To mention a few: Estimation of metric and topological entropy, complexity analysis of time series, detection of determinism in noisy time series, recovery of control parameters in symbolic sequences of unimodal maps, and characterization of synchronization. In all these applications, computational efficiency and robustness against observational noise are a crucial advantage.

The first part of the talk will be a review of the basics of permutation entropy. In the second part, the focus will be on applications to the analysis of biomedical series. In particular, we expect to report on work in progress in this field.

REFERENCES

[1] José M. Amigó, Permutation Complexity in Dynamical Systems. Springer Verlag, 2010 (ISBN: 978-3-642-04083-2)