Recent Improvements on Complexity Measures for Time Series

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Complexity in time series is a very difficult concept to be defined. Many attempts have been made in the last years, but no consensus has been reached yet. The interpretation of complexity varies across disciplines and scientific fields, and other related terms such as entropy, uncertainty, regularity, or predictability, among others, have also been introduced as other ways to refer to complexity or its variations. As a result, the scientific literature is flooded with methods aimed at quantifying complexity in its various forms, with very good results reported, regardless of the specific term used and its correctness.

However, this abundance of methods can be counterproductive. It is very difficult for researchers to choose a method that best suits the needs and features of the problem at hand. They can get lost in a maze of methods, parameters, and time series. Frequently, many research papers are clones of previous ones with regard to the metric employed, its parameters, and the time series under analysis. This "one-size-fits-all" approach is preventing other novel methods or configurations to emerge as potentially more robust or improved tools. This is even getting worse, since those new methods and applications remain unnoticed due to the large amount of complexity papers published almost every day based on already classical methods. Consequently, it is very important to shed some light on the possible better performance of these methods and devote some efforts to characterize them and contribute to its more widespread use.

The main objective of this special issue was precisely to highlight the last developments on complexity measures or related metrics and applications and provide researchers with a more focused view of the tools currently available. Papers had to address the complexity analysis of less usual time series in these contexts, such as seismic or glucose time series, employ more recently proposed metrics well beyond the classical approximate or sample entropy, use different parameter configurations, or customize already existing methods to improve their robustness or reduce their input parameter dependence. We hope this objective will be achieved, and we also hope this characterisation effort will carry on due to its enormous interest and importance.

This special issue includes 6 published papers, out of a total of 19 submitted.


Conflicts of Interest

The guest editors declare that there were no conflicts of interest regarding the submissions in this special issue.
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