Complexity

Special Issue on

Complexity in Neural and Financial Systems: From Time-Series to Networks

CALL FOR PAPERS

In real world, the functioning of most systems can be described in terms of temporal fluctuations of a collection of unitary constituents. This allows their "activity" to be represented in terms of time-series, thus leading to the definition of characteristic patterns of self-organization to be revealed only by employing multiple time-series analysis. Prominent examples are offered by neural and financial systems as brain neurovascular and neurophysiological signals as well as stock prices fluctuations witness.

The usual method of analysis prescribes to, first, cross-correlating the series and, then, applying a threshold to associate a network to the system of interest. Unfortunately, this kind of approach has been proven to be unsatisfactory under several respects, thus leaving an open question: what is the best strategy to unearth fundamental information of such systems?

Answering this urgent question would represent a first step towards the resolution of a more challenging issue: the identification of clusters whose units are characterized by significantly correlated activities. This, in turn, would shed light on the mechanisms driving the evolution of systems characterized by highly nontrivial patterns of dynamic self-organization, as the neural and financial ones.

The choice of focusing on these two kinds of systems is dictated by the importance that topics like portfolios risk-minimization, brain-modules detection, and the like have gained in recent years, in turn allowing researchers to access unprecedented amounts of data.

This special issue is intended to collect contributions proposing novel techniques for the analysis of systems described by multiple time-series as functional and structural brain data, stock prices and stock market indices, and interbank and trade networks.

Potential topics include but are not limited to the following:

- Null models for the analysis of time-series and correlation matrices
- Noise reduction and filtering techniques for correlation matrices
- Correlation-based community detection algorithms
- Mapping techniques between correlation matrices and networks
- Mapping techniques between time-series and networks
- Filtering techniques for networks
- Identification of precursors of stock market movements
- Detection of early warning signals of financial and economic critical events
- Testing-causality techniques in functional brain data
- Statistical methods for inverse problems in functional and structural brain data

Authors can submit their manuscripts through the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/complexity/icnf/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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