Estimation of the TQ-complexity of chaotic sequences

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Abstract. A new approach is proposed to the quantitative estimation of the complexity of multidimensional discrete sequences in terms of the shapes of their trajectories in the extended space of states. This approach is based on the study of the structural properties of sequences and is suitable for estimating the complexity of both chaotic and stochastic sequences. It is constructed on the method, proposed earlier by the author, of symbolic CTQ-analysis of multidimensional discrete sequences and mappings. The algorithm proposed manipulates not only the frequency of occurrence of symbols, but also takes into account their sequence order. An example (financial time series) is given that demonstrates the application of the tools developed.

Keywords: Discrete-time systems, Time-series analysis, Stochastic complexity, Estimation algorithms, Chaos theory, TQ-complexity, Symbolic CTQ-analysis.

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