

Heterogeneity measure for recurrence networks from chaotic and noisy time series

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Abstract:

Recurrence networks are important statistical tools used for the analysis of time series data with several practical applications. We present a new measure for the degree heterogeneity of unweighted and undirected complex networks that can be derived from the degree distribution of the network. We show how this measure varies as the nature of the network varies from completely homogeneous, star, random, scale free and completely heterogeneous network. Specifically, we find that the heterogeneity of an evolving scale free network decreases as a power law with the size of the network N . This new measure is especially suited to understand the heterogeneity of recurrence networks constructed from the time series of low dimensional chaotic attractors and hence it provides a single index to compare the structural complexity of chaotic attractors.

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