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Classification of networks for their synchronous dynamics

Small subnetworks, such as network motifs, and their modularity have been considered to play an important role in large complex networks. In this context, a major topic is the interplay between network structures and their corresponding dynamics. We consider one form dynamics, synchrony-breaking in a network. This can be interpreted as speciation, differentiation of cells, or clustering of gene expression patterns. For any network we construct a mathematical structure, a lattice, which results from the eigenvalues and eigenvectors of the network's adjacency matrix. Many networks have the same lattice, allowing a large number of networks to be classified into a smaller number of lattice structures. Furthermore, by looking at the lattice structure we can identify networks with similar synchronous dynamics.

REFERENCES

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