

Measuring centrality by a generalisation of degree

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Abstract

Identification of key nodes is a fundamental issue in network analysis. We propose a centrality measure called generalised degree, which takes the importance of neighbours into account. It improves on degree by redistributing its sum over the network with the consideration of the global structure. Its application is supported by a set of favourable properties. Generalised degree has a graph interpretation and can be calculated iteratively. We also give a sufficient condition for the measure to be rank monotonic, excluding counterintuitive changes in the centrality ranking after certain modifications of the network, and extensively discuss its relation with degree. Finally, some related centrality measures will be presented together with a set of axioms useful in the choice among metrics.

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