

## عنوان مقاله:

Game theory approach in analyzing biological networks

## محل انتشار:

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## خلاصه مقاله:

Recent progress in high throughput technologies have generated big data at various levels of biological systems such as genomics, transcriptomics, metabolomics and proteomics data. Some of these data can be interpreted in network content, known as biological networks. These networks originally express the pairwise interaction of cell components. These networks include valuable information that help us to realize cell better. The constructed networks usually are large-scale thus it is necessary to use appropriate mathematical methods for analyzing them. Some of this common analysis in biological networks are centrality analysis that can characterize the central nodes and even edges. In fact, centrality measures aim to give a numerical characterization of a node's significance in a network. The common centralities are degree centrality, betweenness centrality and closeness centrality; however, these measurements have well-known limitations and do not consider functioning of a group of nodes rather than an individual node. The group centrality develops more sophisticated measures using cooperative game theory. This centrality is calculated based on Shapley value. The Shapley value is a solution concept in cooperative game theory. Recently, a centrality based on game theory has been introduced and used in defeating terrorist networks. In this study, we use this concept for analyzing biological networks and compare its result with degree centrality, betweenness centrality and closeness centrality.

## کلمات کلیدی:

Game theory; Biological Networks; Shapley Value; centrality measure

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