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RESEARCH ARTICLE

NNPEC: Neighborhood node propagation entropy centrality is a unique way to find the influential node in a complex network

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Summary

In complicated networks, it is still difficult to determine which nodes are influential. To increase the accuracy for identifying influential nodes (IN), several measures have been undertaken in complex networks (CN). Reviewing the research on network attacks, information distribution, and pandemic spread require identifying effective INs. As a result, determining INs in complicated networks has attracted more and more attention toward researchers. Various approaches have been proposed in recent years, each with pros and cons. The development of algorithms to study static social networks has been the focus of previous research. However, social networks are dynamic networks that change over time and are not static. The impact of source localization is generally weak since most existing approaches do not fully exploit the infection of neighboring information in nodes. This research proposes a novel Neighborhood Node Propagation Entropy Centrality (NNPEC) technique for finding the INs in CNs. This technique also helps to identify the neighborhood node entropy and determines each node's ability to spread among uninfected neighboring nodes. The proposed strategy is applied to six different datasets from different domains, including C-Elegance, Dolphins, Facebook, Gowalla, Karate, and USA Power Grid. Some of the performance evaluations, like maximum degree (MD), average degree (AD), number of nodes, edges and cluster coefficient (CC), are analyzed and compared with different existing algorithms. In the experimental section, a proposed method obtained an MD of 16.66, CC of 0.564, AD of 3.92, edges of 76 and nodes of 33 for the karate dataset. Also, some other existing techniques are compared to prove the efficiency of the proposed method.

CONFLICT OF INTEREST STATEMENT

Authors have no conflict of interest to declare.

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DATA AVAILABILITY STATEMENT