ABSTRACT

Community detection in directed networks is a problem that attracts more and more interest from researchers, as it allows to reveal the structure and dynamics of complex networks. The aim of this research is to propose a new approach for community detection adapted to directed graphs, which takes into account the directionality of links and the similarity between nodes. Our approach combines the Leiden algorithm, which is an efficient and robust algorithm for maximizing modularity, and network embedding, which is a technique for representing the nodes of the network as vectors in a vector space. We have optimized the formula for calculating directed modularity, so that it integrates the similarity between nodes calculated from the network embedding. We have experimented our approach on a set of real data and we have compared its performance with those of other existing approaches. The results show that our approach significantly improves the accuracy and directionality of community detection in directed graphs.

Keywords : Community detection, directed graph, networks, community, network embedding.