

A procedure of generation of directed graphs for the comparative study of algorithms for the detection of communities.

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Abstract:

In 2016, in this conference was presented an algorithm for detection of directional communities in a directed graph [1], with a special interest in the graph representing the process of access to the SUPE [2,3].

The proposed algorithm allowed to obtain communities that provided an approximation to the problem. In addition, the resulting graph had more than acceptable values of modularity.

Although it was compared with other algorithms, which did not provide an adjusted solution to this problem, these algorithms in most of the cases, as described in the literature, were originally designed for non-directed graphs. Moreover, there was not available any measure of the goodness of these solutions in regard to that particular problem, even for the proposed algorithm.

In [4,5,6], Lancichinetti and Fortunato propose benchmarks for the evaluation of community detection algorithms.

In this paper, we propose a benchmark to automate the evaluation of community detection algorithms for weakly connected directed graphs, such as the algorithm proposed in [1], which be more appropriate than those benchmarks proposed in [4,5,6].

Although most of the graphs representing complex networks are non-directed graphs, such as Neural Networks, social networks, social interrelations, the contagion of diseases, bibliographies, etc, there are also other problems whose modeling entails obtaining a weakly connected directed graph or in the worst

case directed and disconnected graph: such as the student access to the SUPE, the public transport networks on trains and bus lines, or the trophic chains [7,8,9]. Those cases deserve particularized study with an analysis and the resolution adjusted to them.

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