

Community Detection in Complex Networks using Genetic Algorithm

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Community structure identification has been an important research topic in complex networks and there has been many algorithms proposed so far to detect community structures in complex networks, however most of the algorithms are not suitable for very large networks because of their time-complexity. Another drawback of these algorithms is that they need apriori knowledge about the community structure like number of communities or some threshold values in order to truly identify the community structure.

Genetic algorithm for detecting communities in complex networks is presented here. It is scalable to very large networks and does not need any priori knowledge about number of communities or any threshold value. The algorithm tries to find the best splitting of the network into communities that yields the highest network modularity using genetic algorithm methods. It has $O(e)$ time-complexity where e is the number of edges in the network. Its accuracy is tested with the known Zachary Karate Club and College Football datasets. Enron e-mail dataset is used for scalability test.

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