Abstract

A large number of networks in nature, society and technology are defined by a mesoscopic level of organization, in which groups of nodes form tightly connected units, called communities, that are sparsely inter-linked to each other. Identifying this community structure is one of the most important problems in understanding of functions and structures of real world complex systems, which is still a challenging task. Various methods proposed so far are not efficient and accurate for large networks which comprise of millions of nodes because of their high computational cost.

In this manuscript we will provide the implementation and behavioral analysis of BGLL algorithm for determining the structure of complex networks. This method is a variant of hierarchical agglomerative clustering approach, which finds the communities which are nested within one another. This method emphasizes on the idea of building the communities by combining the initial partition into super networks by repeatedly optimizing the modularity. In this work we will implement the BGLL Algorithm on various large networks which exhibit the community structure. We will also determine the optimal modularity at every pass and determine the hierarchical structure of large complex systems that comprise of millions of nodes. We will also provide a brief comparison of BGLL algorithm with some methods.
References

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- Xu Liu a, Jeffrey Yi-Lin Forrest a,b, Qiang Luoc, Dong-Yun Yi a,, ? Detecting community structure using biased random merging.
- Code of the BGLL is used from the link http://findcommunities.googlepages.com.

**Index Terms**

Computer Science  
Networks

**Keywords**

Complex Networks  
Community Structure