Community Detection Clustering in Complex Networks using Gumbel Softmax

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Community detection is an important research topic in Networks Science. The goal of community detection is to identify clusters of nodes, where members of each cluster are densely connected with other cluster members. Such an analysis brings to light a deeper understanding of network data, large-scale patterns and structures not directly visible, and the nature of interactions [1].

Machine Learning and Deep Learning algorithms are very useful in solving problems involving an enormous volume of data, especially in the case of complex networks. In this project, we plan to address the community detection clustering problem for complex networks using the Gumbel Softmax approach [2]. The paper discusses a method for community detection in unlabelled datasets, which similar past works have not addressed. Regarding the dataset, we have chosen the Facebook Page-Page Networks dataset of artists' pages [3]. It represents an undirected, unweighted complex network where verified (blue tick) Facebook pages of artists are the nodes, and mutual likes among the pages are the edges.

Apart from community detection clustering, we will also implement relevant classroom concepts for our dataset. This will help us better understand the concepts and the dataset itself, which will most certainly be useful in the research problem.

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References

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