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# Detecting one-mode communities in bipartite networks by bipartite clustering triangular

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**Abstract:** In this paper, an algorithm is proposed to detect one-mode community structures in bipartite networks, which one-mode community structures are weighted. After analyzing the topological properties in bipartite networks, the bipartite clustering triangular are introduced. First, bipartite networks are projected into two weighted one-mode networks by bipartite clustering triangular. Then extracting all the maximal sub-graphs from two one-mode weighted networks respectively and merging the maximal sub-graphs by weighted clustering threshold. In addition, the proposed algorithm successfully finds overlapping vertices between one-mode communities. Experimental results using some real-world networks data shows that the performance of the proposed algorithm is satisfactory.

**Keywords:** Bipartite networks; Community structures; Bipartite clustering triangular; Weighted clustering threshold.

## 1. Introduction

Researching for complex network is no longer confined to one-mode networks or unipartite networks. Detecting the community structures can effectively understand the structures and function of the whole bipartite networks, so scholars have gradually discovered bipartite features in real networks at present [1-7]. Bipartite networks can be described as a bipartite network with two non-overlapping sets of vertices, where all edges have one end vertex belonging to each set. There is no edge between the same set of vertices. At present, the community structures in bipartite networks also do not have a unified definition, so the definition of community structures in one-mode networks is applied to the definition of community structures in bipartite networks. In bipartite networks, a bipartite community is of dense internal links and some bipartite communities are sparse connections among them [8]. For example, squares and circular are on behalf of vertices belonging to two different sets respectively shown in Fig. 1 and there are three communities in this bipartite network.

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