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Matthew Yancey* (mpyancey1@gmail.com). *Bipartite Communities*.

A recent trend in data-mining is to find communities in a graph. Generally speaking, a community of a graph is a vertex set such that the number of edges contained entirely inside the set is “significantly more than expected.” These communities are then used to describe families of proteins in protein-protein interaction networks, among other applications. We present a new goal in community detection: to find good *bipartite communities*. A bipartite community is a pair of disjoint vertex sets S, S' such that the number of edges with one endpoint in S and the other endpoint in S' is “significantly more than expected.” We claim that this additional structure is natural to some applications of community detection. In fact, using other terminology, they have already been used in two different studies on distinct biological networks.

We will present a new algorithm for finding many bipartite communities using spectral methods. Classical community detection is known to be **NP**-hard; our algorithm is an approximation method with rigorous bounds. Additionally, we will present how the algorithm performs on public-source data sets. (Received January 06, 2015)