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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. 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 February 16, 2015)