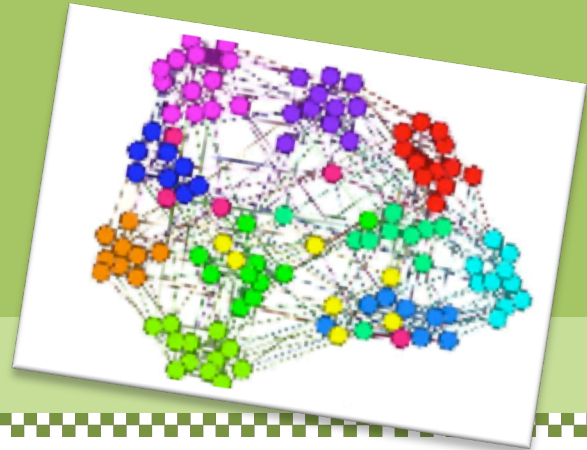


Applied Math Seminar

United States Naval Academy

Tuesday Sept. 8, 2015

12 noon, Room CH 351



Spring 2015

Bipartite Community Detection

Speaker

Kelly Yancey

Department of
Mathematics

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Community detection in data is a large and ongoing area of research. A community in a graph is a vertex set S such that there are many edges between the vertices of S . Recently the combinatorial Laplacian and the normalized Laplacian of a graph have been used to describe the community structure of the graph. Specifically, analyzing the smallest eigenpairs can be used to find a set of good communities.

In this talk we are specifically interested in bipartite community detection, that is we are interested in finding two subsets of the graph S and S' where the number of edges between S and S' is significantly more than expected. This type of community detection has already been implemented in studying protein interactions. We will present the algorithm for detecting bipartite communities.

We will also discuss the limits of the algorithm for finding bipartite communities. Specifically, we will discuss why one of these bounds is sharp. These graphs are also of independent interest as their construction has applications to such fields as coding theory.

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