

1068-68-278

**Hongwei Wu\*** ([hongwei.wu@gatech.edu](mailto:hongwei.wu@gatech.edu)), 210 Technology Circle, Savannah, GA 31407. *Spectral Clustering for Detecting Modules from the Functional Protein Association Networks of Bacteria*. Preliminary report.

Presence of clusters is one of the properties shared by many real-world networks, where within the same cluster nodes are densely connected and between clusters nodes are sparsely connected. Detecting clusters has significant implications in many fields. For example, modules in gene regulatory networks often correspond to function units of the cellular machinery to fulfill certain biological objectives, and therefore often render contextual information for drug designs. Several methods have been developed for detecting clusters of a network, among which spectral clustering has recently emerged particularly effective, because (1) it does not necessarily rely on topological properties of the network and can therefore be applied to a broad spectrum of networks, (2) the natural clusters in the data do not necessarily correspond to convex regions, (3) its optimality has been theoretically proved and empirically demonstrated, and, (4) it is easy to implement. Here we apply spectral clustering to functional module detection of biological networks. We investigate the functional protein association networks of six bacterial model organisms and discuss how the parameter of spectral clustering can be tuned to render functionally and evolutionarily relevant modules. (Received January 19, 2011)