

On clustering detection based on a quadratic programming in hypergraphs

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A proper cluster is usually defined as maximally coherent groups from a set of objects using pairwise or more complicated similarities. In general hypergraphs, clustering problem refers to extraction of sub-hypergraphs with a higher internal density, for instance, maximal cliques in hypergraphs. The determination of clustering structure within hypergraphs is a significant problem in the area of data mining. There have been various works of detecting clusters on graphs and uniform hypergraphs that were published in the past decades. Recently, it has been shown that the maximum $\{1, 2\}$ -clique size in $\{1, 2\}$ -hypergraphs is related to the global maxima of a certain quadratic program based on the structure of the given non-uniform hypergraphs. In this talk, we give a vertex-weighted extension and also extend this result to relate strict local maxima of this program to certain maximal cliques including 2-cliques or $\{1, 2\}$ -cliques. This is joint work with Drs. Tang and Zhang.