Network of likes and dislikes: Conflict and membership

Beom Jun Kim, Sungkyunkwan University

We all have friends and foes. In the study of complex networks, such a pairwise interaction is described by a directed link since the relation is not necessarily symmetric. We study a real network constructed from a survey in which each individual chooses five members (s)he wants to work with, and other five (s)he does not like to work together. Although everyone's outdegrees for such like and dislike links are fixed to five, respectively, it is found that indegree sequence for each type of links exhibits very different behaviors. We also pursue to answer the question of proper divisions of the organization based on the concept of happiness defined for each directed relation. For example, two individuals connected by like (dislike) links in both directions are happy if they belong to the same (different) group(s). We then adopt the framework of the q-state Potts model with long-ranged ferromagnetic and antiferromagnetic interactions and discuss the group structure in the organization that minimizes a suitably defined unhappiness.