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Community and hierarchy in generalized collaboration networks

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generalization of social collaboration network, which we term generalized collabora-
tion network. In this kind of network, nodes are defined as actors, two nodes are
connected by an edge when they take part and collaborate in a common act. In an
act each pair of actors has collaboration relationship therefore an act is described
by a clique. Based on the common topological property, we proposed quantitative
definitions of network community and hierarchy and their corresponding search al-
gorithms. In a generalized collaboration network, two cliques can share a number of
nodes. We define the connecting cliques as ‘1-hierarchy community’ when they share
at least one common node between each other; accordingly, we define a ‘2-hierarchy
community’ as a set of cliques which are mutually connected through at least two
common nodes; in general, a ‘h-hierarchy community’ is defined as the set of cliques
which are mutually connected through at least h nodes. We also propose a novel
statistical parameter, i.e. degree of interweavement, to measure the connectivity of
the whole network.

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