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Two-Graphs Walk Into a Bar: Generalizing Social Networks

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We can use a signed complete graph, where every pair of vertices is adjacent by either a positive or negative edge, to represent a social network where all possible relationships are friendly or antagonistic. We call it “balanced” if the edges of every circle have positive sign product, reflecting the adage that “the enemy of my friend is my enemy, the enemy of my enemy is my friend”, etc.

As relationships change over time it is expected that a social network tries to become more balanced. Recent studies on the dynamics of social networks show that sometimes the network “jams” without becoming balanced.

A two-graph is a way to describe the balance or lack thereof in a signed complete graph. I will discuss some of the properties of two-graphs that are relevant to social network dynamics.
