Facebook, Cornell researchers analyze romantic ties

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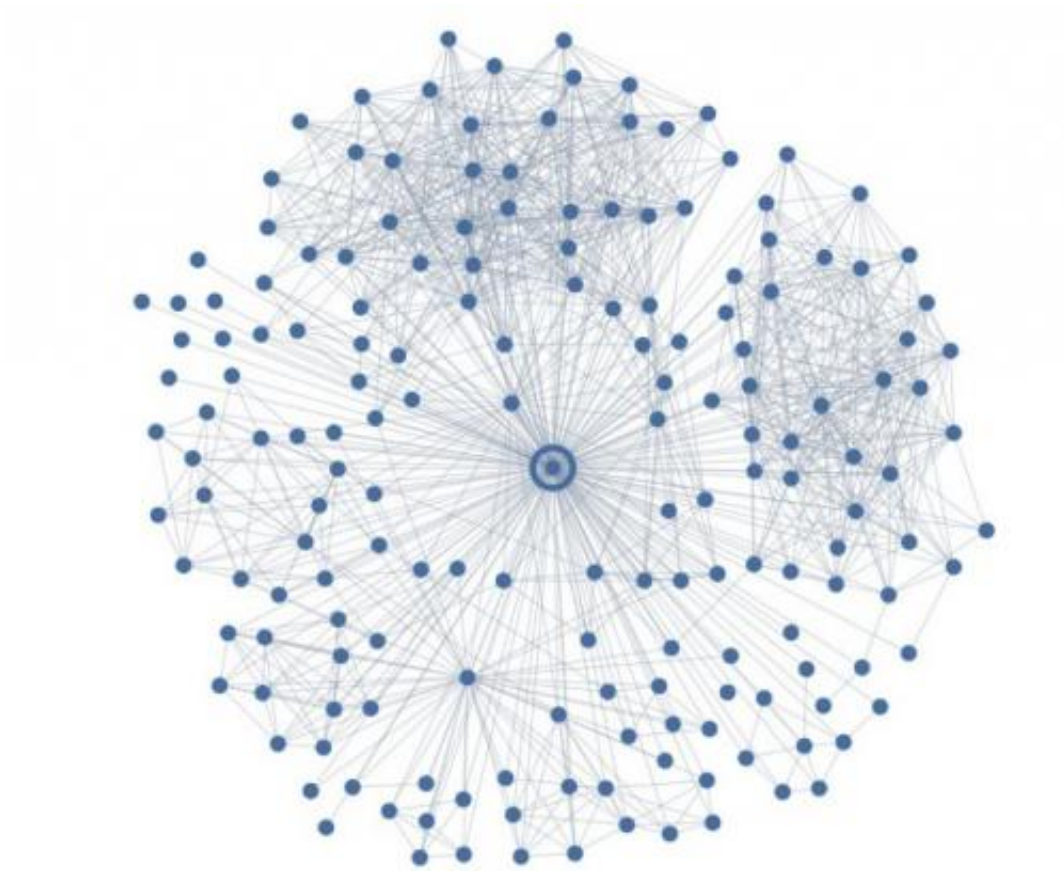

A network neighborhood. Credit: arXiv:1310.6753 [cs.SI]

Facebook's Eric Backstrom, senior engineer, together with Jon Kleinberg, a computer scientist at Cornell University, have sparked interest with the online publication over the weekend of their paper,

"Romantic Partnerships and the Dispersion of Social Ties: A Network Analysis of Relationship Status on Facebook," also to be presented at a conference on social computing in February. The authors found that with their special tool in analyzing linked structures, they can figure out how to identify your romantic partner or best friend from among your connections. The two researchers were able to show that the shape of a person's social network is a powerful signal for identifying one's spouse or romantic partner. Their approach reportedly can even spot if a relationship is likely to break up.

They wrote, "Here we investigate this question for a particular category of strong ties, those involving spouses or romantic partners. We organize our analysis around a basic question: given all the connections among a person's friends, can you recognize his or her romantic partner from the network structure alone?"

One is tempted to say, obviously, in social networking terms, embededness would be the standard tool for such indications. Commenting on embededness, the researchers said, "The key structural feature used in these analyses is the notion of embeddedness—the number of mutual friends two people share, a quantity that typically increases with tie strength. Indeed, embeddedness has been so tightly associated with tie strength that it has remained largely an open question to determine whether there are other structural measures, distinct from embeddedness, that may be more appropriate for characterizing particular types of strong ties."

The authors believe they have found a more effective network measure, which they call dispersion.

"Crucial aspects of our everyday lives may be encoded in the network structure among our friends, provided that we look at this structure under the right lens," said the authors. They said that embeddedness is in

fact a comparatively weak means of characterizing romantic relationships. Instead, the authors support this alternative "dispersion" measure and they say that is significantly more effective.

"Our measure of dispersion looks not just at the number of mutual friends of two people, but also at the network structure on these mutual friends; roughly, a link between two people has high dispersion when their mutual friends are not well connected to one another."

All Facebook data in their analyses was used anonymously and all analysis was done in aggregate. They found that their algorithm was 60 percent accurate in identifying declared relationships. They also found that when their algorithm failed, it looked as if they relationship may be in trouble and the people without a high dispersion were 50 percent more likely to break up within two months than a couple with high dispersion.

More information: Romantic Partnerships and the Dispersion of Social Ties: A Network Analysis of Relationship Status on Facebook, arXiv:1310.6753 [cs.SI] arxiv-web3.library.cornell.edu/abs/1310.6753v1

Abstract
A crucial task in the analysis of on-line social-networking systems is to identify important people —- those linked by strong social ties —- within an individual's network neighborhood. Here we investigate this question for a particular category of strong ties, those involving spouses or romantic partners. We organize our analysis around a basic question: given all the connections among a person's friends, can you recognize his or her romantic partner from the network structure alone? Using data from a large sample of Facebook users, we find that this task can be accomplished with high accuracy, but doing so requires the development of a new measure of tie strength that we term `dispersion' —- the extent to which two people's mutual friends are not themselves well-connected.

The results offer methods for identifying types of structurally significant people in on-line applications, and suggest a potential expansion of existing theories of tie strength.

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