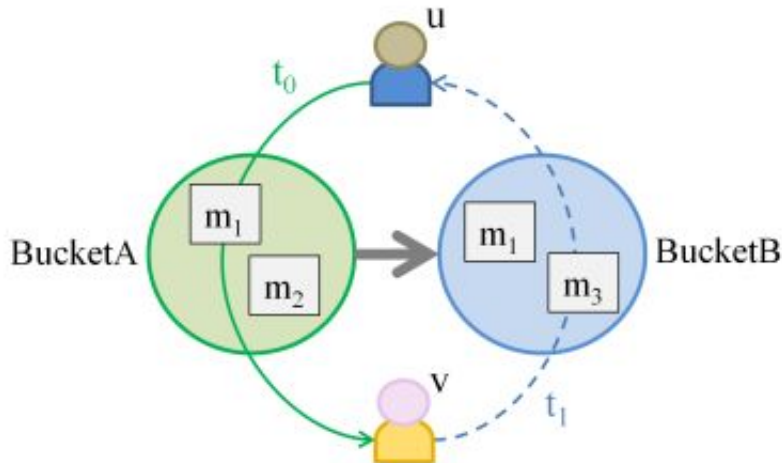# Analysis team drills down on social networks

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Example of construction of the Conversation Graph from conversation data. Credit: arXiv:1407.5547 [cs.CY]

Whether a teacher is posting a link for a colleague or a pet owner is sending her sister a photo of her sleeping dog, everything is of consequence for a newer breed of social network analysts who are trying to use their computers to map out social behavior and understand social structures. Researchers are eyeballing messages online, from informational, to chatty, to networking attempts—who likes who and who is following who. MIT Technology Review now reports on a recent effort to peer even further into social structures. In a paper recently submitted to the arXiv server, a team takes a still more nuanced analysis of online social data.

"Reading the Source Code of Social Ties" is by Luca Maria Aiello, research scientist at Yahoo Labs Barcelona, Rossano Schifanella, University of Torino, and Bogdan State, Stanford. The work was done when Schifanella and State were visiting Yahoo Labs Barcelona. In their paper, they discussed three different categories. Describing their work, MIT Technology Review said, "They tease apart the nature of the links that form on social networks and say these atoms fall into three different categories. They also show how to extract this information automatically and then characterize the relationships according to the combination of atoms that exist between individuals. Their ultimate goal: to turn anthropology into a full-blooded subdiscipline of computer science."

The authors used data sets from large social networks, messages sent between users of the aNobii social network, which people use to talk about books and users who commented on their photos on Flickr. One category was social-status messages, displaying appreciation or announcing the creation of the social tie such as a follow or like. The second category involved social support of some kind, such as greeting or welcoming someone to a website, to express affection or send wishes, jokes and laughter. The third category was knowledge exchange. The team worked on an algorithm to categorize the messages based on message content and similarity to messages of the same type.

The authors said they believed their methods would find applications in "online social media services," ranging from recommendation to visual link summarization.

MIT Technology Review called the study fascinating, providing "a new way of looking at social ties as strings of interactions. In a way, it changes the atomic theory of social ties into a kind of string theory."

Their paper won a best-presentation award in June at the ACM Web Science 2014 Conference at Indiana University, Bloomington.

**More information:** Reading the Source Code of Social Ties, arXiv:1407.5547 [cs.CY] arxiv.org/abs/1407.5547

## Abstract

Though online social network research has exploded during the past years, not much thought has been given to the exploration of the nature of social links. Online interactions have been interpreted as indicative of one social process or another (e.g., status exchange or trust), often with little systematic justification regarding the relation between observed data and theoretical concept. Our research aims to breach this gap in computational social science by proposing an unsupervised, parameter-free method to discover, with high accuracy, the fundamental domains of interaction occurring in social networks. By applying this method on two online datasets different by scope and type of interaction (aNobii and Flickr) we observe the spontaneous emergence of three domains of interaction representing the exchange of status, knowledge and social support. By finding significant relations between the domains of interaction and classic social network analysis issues (e.g., tie strength, dyadic interaction over time) we show how the network of interactions induced by the extracted domains can be used as a starting point for more nuanced analysis of online social data that may one day incorporate the normative grammar of social interaction. Our methods finds applications in online social media services ranging from recommendation to visual link summarization.

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