

Emergence of Consensus and Topical alignment in online social systems

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Understanding the dynamics of social interactions is crucial to comprehend human behavior. The emergence of online social media has enabled access to data regarding people relationships on a large scale. Twitter, specifically, is an information-oriented network, with users sharing and consuming information. Here, we first show how the emergence of consensus can be characterized by a structural transition in the communication network, and secondly, we study whether users tend to be in contact with people interested in similar topics, i.e., if they are topically aligned. Specifically, we present a methodology that allows characterizing, using microblogging data, information-driven systems as mutualistic networks. Our results show that collective attention around a topic is reached when the user-meme network self-adapts from a modular to a nested structure, which ultimately allows minimizing competition and attaining consensus. We also propose an approach based on the use of hashtags to extract information topics from Twitter messages and model users' interests. Our results show that, on average, users are connected with other users similar to them and stronger relationships are due to a higher topical similarity. Furthermore, we show that topical alignment provides interesting information that can eventually allow inferring users' connectivity. Our work contributes to a better understanding of how complex social systems are structured.