Polarization and information spreading in Brazilian political communication networks

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Information spreading in networked systems crucially depends on several topological signatures of the underlying substrate, such as the degrees heterogeneity or the presence of a community structure. Recently, it has been shown that the temporal dimension of networks also has a deep impact on the behavior of such epidemic processes. In many cases of interest, and in communication networks in particular, the presence of communities is often associated with clusters of individuals sharing the same opinions. Political communication networks, in particular, can exhibit a highly segregated partisan structure, with extremely limited connectivity between the clusters. Such echo chambers are expect to affect the information diffusion on communication networks. Here, we reconstruct a time-varying political communication network, involving a large set of individuals, gathering data from the social microblogging platform Twitter, and study how information spread on it. We focus on the Brazilian political situation between 2015 and 2016, shaped by the impeachment process to the former Brazilian President, Dilma Rousseff. During the impeachment, individuals were mainly split into two groups: those supporting Rousseff and those against her. The massive participation in street protests and manifestation, both in favor or against Rousseff, involved a large set of individuals for a considerably long time period, and left interesting digital fingerprints in online social networks. We show that political polarization of users impacts the information diffusion: messages sent by extremely polarized individuals spread throughout the network worse than those sent by not-so polarized ones, potentially reaching a smaller audience. To this aim, we implement a simple Susceptible Infected (SI) model, and measure the information diffusion by defining the spreadability and reachability of each users. Our findings show that a partisan structure, due to political polarization, weakens information diffusion in political communication networks, and prevent messages sent by extremely polarized individuals to spread out the community of origin.

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