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Qian Li, Chenguang Song, Bin Wu, Yunpeng Xiao, Bai Wang

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Social Hotspot Propagation Dynamics Model Based on Heterogeneous Mean Field and Evolutionary Games

Qian Li^{a,b,*}, Chenguang Song^b, Bin Wu^a, Yunpeng Xiao^b, Bai Wang^a

^aBeijing Key Laboratory of Intelligence Telecommunication Software and Multimedia,
Beijing University of Posts and Telecommunications, Beijing 100876, PR China

^bChongqing Engineering Laboratory of Internet and Information Security, Chongqing
University of Posts and Telecommunications, Chongqing 400065, PR China

Abstract

In the field of social network analysis, information diffusion is a focus of current research. Taking into account the real topological relations among the participants and the psychological characteristics of the users, in this paper, a hotspot propagation model based on heterogeneous mean field and evolutionary games is proposed. First, in real social networks, the changes of hotspot's trend could lead to the dynamic changes of users' willingness to participate in the hot topic. This effect is reflected in the dynamic behaviors among the users. In this work, based on the evolutionary games, a dynamic evolution mechanism for users' willingness to participate in hotspot is constructed and dynamically adjusts the infection rate of information dissemination model. Second, in view of the heterogeneity of the real network structure and the complexity of the heterogeneous mean field, graphical evolutionary game is introduced to improve the heterogeneous mean field. Thus, a new dynamics model of information dissemination is constructed based on graphical evolutionary game. Finally, considering the dynamic behavior among the nodes and the heterogeneity of real social networks, we obtain a hotspot propagation model based on dynamic evolution mechanism and improved heterogeneous mean field. To verify the proposed model, we perform simulations over synthetic networks and real network. Experiments show

*Corresponding author

Email address: liqian2017@bupt.edu.cn (Qian Li)

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