

基于重叠社区搜索的传播热点选择方法*

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摘要: 随着社交网络的蓬勃发展, 信息传播问题由于具有广泛的应用前景而受到广泛关注, 影响力最大化问题是信息传播中的一个研究热点. 它致力于在信息传播过程开始之前选取能够使预期影响力达到最大的节点作为信息传播的初始节点, 并且大多采用基于概率的模型, 如独立级联模型等. 然而, 现有的影响力最大化解决方案大多认为信息传播过程是自动的, 忽略了社交网络平台在信息传播过程中可以起到的作用. 此外, 基于概率的模型存在一些问题, 如无法保障信息的有效传播、无法适应动态变化的网络结构等. 因此, 提出了一种基于重叠社区搜索的传播热点选择方法. 该方法通过迭代式推广模型根据用户行为反馈逐步选择影响力最大化节点, 使社交网络平台在信息传播过程中充分发挥控制作用. 提出了一种基于重叠社区结构的方法来衡量节点影响力, 根据这种衡量方式来选择传播热点. 提出了解决该问题的两种精确算法(包括一种基本方法和一种优化方法)以及该问题的近似算法. 通过大量实验验证了精确及近似算法的效率、近似算法的准确率以及迭代式传播热点选择方法的有效性.

关键词: 影响力最大化; 信息传播; 重叠社区; 社交网络

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Approach for Hot Spread Node Selection Based on Overlapping Community Search

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Abstract: With the development of social network, information diffusion problem has received a lot of attention because of its extensive application prospects, and influence maximization problem is a hot topic of information diffusion. Influence maximization aims at selecting nodes that maximize the expected influence as initial nodes of information diffusion, and most work on influence maximization adopts probabilistic models such as independent cascade model. However, most existing solutions of influence maximization view the information diffusion process as an automatic process, and ignore the role of social network websites during the process. Besides, the probabilistic models have some issues in that, for example, they cannot guarantee the information to be delivered effectively, and they cannot adapt the dynamic networks. To tackle the problem, this paper proposes an approach for hot spread node selection based on overlapping community search. This approach selects influence maximized nodes step by step through the iterative promotion model

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