Abstract

Influence maximization problem is one of the challenges in online social networks. This problem refers to finding a small set of members of a social network, by activation of which information propagation can be maximized using one of the propagation models such as independent cascade model. For the maximization problem, the greedy algorithm has been presented which is close to optimal response by 67% in terms of accuracy; but, the problem of this method is its inefficiency in the social networks with a large number of members. The performed works on the improvement of the greedy algorithm have been mostly faced with the problem of scalability, dependence on graph structure, or need for large memory. In this paper, a method was presented using automata learning which could preserve its efficiency in large social networks and obtain results with near-optimal values. For this purpose, space of the problem was reduced by removing low-degree nodes and the effective nodes for starting propagation in social network was found by automata learning which is optimal for achieving global optimization. The obtained results of this paper showed that the proposed method was efficient in large social networks and its results were close to the ones obtained by the greedy algorithm in terms of
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accuracy.

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**Index Terms**

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Social networks, Influence maximization, Propagation models, Learning automata