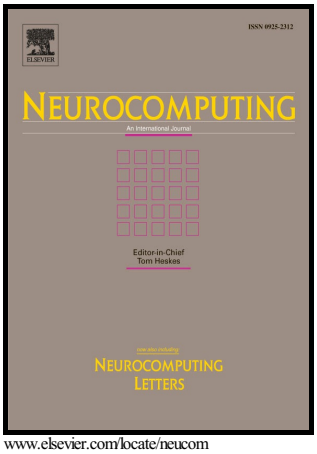

www.elsevier.com/locate/neucom

Identification of influential nodes in social networks with community structure based on label propagation

Yuxin Zhao, Shenghong Li, Feng Jin

PII: S0925-2312(16)30593-8
DOI: http://dx.doi.org/10.1016/j.neucom.2015.11.125
Reference: NEUCOM17205

To appear in: *Neurocomputing*

Received date: 14 April 2015
Revised date: 4 November 2015
Accepted date: 9 November 2015

Cite this article as: Yuxin Zhao, Shenghong Li and Feng Jin, Identification o influential nodes in social networks with community structure based on labe propagation, *Neurocomputing,* http://dx.doi.org/10.1016/j.neucom.2015.11.125

Identification of influential nodes in social networks with community structure based on label propagation

Yuxin Zhao[a,c,*], Shenghong Li[a,b], Feng Jin[c]

[a]*Department of Electronic Engineering, Shanghai Jiao Tong University, 800 Dong Chuan Road, Shanghai 200240, China*
[b]*School of Information Security Engineering, Shanghai Jiao Tong University, 800 Dong Chuan Road, Shanghai 200240, China*
[c]*IBM China Research Laboratory, 399 Ke Yuan Road, Shanghai 201203, China*

Abstract

Social network is an abstract presentation of social systems where ideas and information propagate through the interactions between individuals. It is an essential issue to find a set of most influential individuals in a social network so that they can spread influence to the largest range on the network. Traditional methods for identifying influential nodes in networks are based on greedy algorithm or specific centrality measures. Some recent researches have shown that community structure, which is a common and important topological property of social networks, has significant effect on the dynamics of networks. However, most influence maximization methods do not take into consideration the community structure in the network, which limits their applications on social networks with community structure. In this paper, we propose a new algorithm for identifying influential nodes in social networks with community structure based on label propagation. The proposed algorithm can find the core nodes of different communities in the network through the label propagation process. Moreover, our algorithm has low time complexity, which makes it applicable to large-scale networks. Extensive experiments on both synthetic and real-world networks under common diffusion models demonstrate the effectiveness and efficiency of our proposed algorithm.

Keywords: Social network, Influential node, Community structure, Label

*Yuxin Zhao
Email address: zhaoyuxin1@sjtu.edu.cn (Yuxin Zhao)