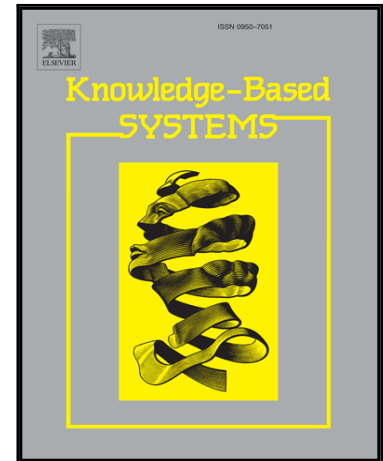


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A novel community detection algorithm based on simplification of complex networks

Liang Bai^{a,b}, Jiye Liang^a, Huangyuan Du^a, Yike Guo^b

^a*Key Laboratory of Computational Intelligence and Chinese Information Processing of Ministry of Education, School of Computer and Information Technology, Shanxi University, Taiyuan, 030006, Shanxi, China*

^b*Department of Computing, Imperial College London, SW7, London, United Kingdom*

Abstract

Efficiently discovering the hidden community structure in a network is an important research concept for graph clustering. Although many detection algorithms have been proposed, few of them provide a visual understanding of the community structure in a network. In this paper, we define two measurements about the leading and following degrees of a node. Based on the measurements, we provide a new representation method for a network, which transforms it into a simplified network, i.e., weighted tree (or forest). Compared to the original network, the simplified network can easily observe the community structure. Furthermore, we present a detection algorithm which finds out the communities by min-cutting the simplified network. Finally, we test the performance of the proposed algorithm on several network data sets. The experimental results illustrate that the proposed algorithm can visually and effectively uncover the community structure.

Keywords: Graph clustering; community detection; network representation; min-cutting problem.

1. Introduction

Since the data are modeled as networks in many complex systems [30], e.g., social networks and biological networks, recently increasing attention

*Corresponding author.

Email addresses: sxbailiang@hotmail.com (Liang Bai), ljiy@sxu.edu.cn (Jiye Liang), duhangyuan@sxu.edu.cn (Huangyuan Du), y.guo@imperial.ac.uk (Yike Guo)

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