

Accepted Manuscript

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PII: S1084-8045(18)30019-5

DOI: [10.1016/j.jnca.2018.01.005](https://doi.org/10.1016/j.jnca.2018.01.005)

Reference: YJNCA 2047

To appear in: *Journal of Network and Computer Applications*

Received Date: 7 July 2017

Revised Date: 29 November 2017

Accepted Date: 19 January 2018

Please cite this article as: Peng, S., Zhou, Y., Cao, L., Yu, S., Niu, J., Jia, W., Influence analysis in social networks: A survey, *Journal of Network and Computer Applications* (2018), doi: 10.1016/j.jnca.2018.01.005.

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Procedia Computer Science 00 (2017) 1–26

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Influence Analysis in Social Networks: A Survey

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Abstract

Complementary to the fancy applications of social networks, influence analysis is an indispensable technique supporting these practical applications. In recent years, this emerging research branch has obtained significant attention from both industry and academia. In this new territory, researchers are facing many unprecedented theoretical and practical challenges. Thus, in this survey, we aim to pave a comprehensive and solid starting ground for interested readers by soliciting the latest work in this area. Firstly, we provide an overview of social networks, including definition, and types of social networks. Secondly, we present the current understanding of social influence analysis from different levels, such as its definition, properties, architecture, applications, and diffusion models. Thirdly, we discuss the evaluation metrics for social influence. Fourthly, we summarize the existing evaluation models on social influence in social networks. We further provide an overview of the existing methods for influence maximization. Finally, we discuss the problems of current algorithms and future trends from various perspectives in this field. We hope this work will shed light for more and more forthcoming researchers to further explore the uncharted part of this promising research field.

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Keywords:

social networks, influence analysis, social influence, evaluation metric, influence maximization.

1. Introduction

Social networks (SNs), such as WeChat, Facebook, and Twitter, have emerged and tightly connected web users all over the world. By analyzing and mining social networks, we can gather information on the comments people make with respect to a particular product. Analysis of such comments shows its valuable for the design of marketing and advertising campaigns. The typical examples are viral marketing [1, 2], influential bloggers finding [3, 4], online advertising [5], social healthcare [6, 7], expert finding [8, 9], personalized commendation [10], citation networks [11, 12], and so on.

Social influence analysis [13] is becoming an important part of social networks. By analyzing the influencing manner among users and the spreading manner of influence based on social networking big data [14], the following advantages can be obtained: 1) in terms of sociology, it is helpful to understand people's social behaviors; 2) in terms

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