Exploring Intelligent Approach of Influence Minimization Considering the Node Surveillance in Online Social Networks

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Research

Keywords: influence minimization, social networks, negative information, live nodes

Posted Date: November 5th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-101760/v1>

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Abstract

Attractive information such as innovations, awareness campaigns, branding, and advertising help people positively. Whereas, awful information such as rumors, malicious viruses, pornography, and revenge disturb people. The negative information contributes to chaos among people; therefore, it is to be blocked and hinder from further diffusion. This has motivated us towards the study of the problem named influence minimization. As the real world network can be modeled to a multilayer network, we focus our study towards the information diffusion through a multilayer network. Each node assigns a threshold, and its variation affects the rate of influence propagation across the network. In the influence minimization problem, the energy level of each node changes that help to formulate the function that minimizes the influence propagation. By applying two reduction policies, we are able to optimize our objective of minimizing the influence towards repulsive information. In this article, we consider the user response and its surveillance in the network. Repeated experiments on real networks has helped us to validate the proposed methods.

Full Text

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Figures

Figure 1

A multiplex network with $V = \{x, y, z\}$ and $L = \{L1, L2\}$

Figure 2

The illustration of influence minimization. (a) a regular graph, (b) a node is infected, (c) information diffuse across networks and (d) blocking infected articulation nodes

Figure 3

The graph shows the relationship between the number of blocked nodes and the number of nodes where in uence spread. Set of seed ($k = 50$) is a subset of blocked nodes and it is formed using metrics such as (a) m-PageRank and (b) Multiplex PageRank. As shown that the higher the value of the number of blocked nodes, the spread decreased. Our proposed policies gain a significant advantage

Figure 4

The graph shows the relation between number of blocked nodes and number of nodes where in uence spread, where $k = 50$. (a1) NetScience using m-PageRank, (a2) NetScience using Multiplex PageRank, (b1) Hep-Th using m-PageRank, and (b2) Hep-Th using Multiplex PageRank