Smart System to minimize Rumor Influence in social networks using user experience

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Abstract: The increasing amount of information on modern social media platforms are valuable in many applications. While the openness and convenience features of social media also spread many rumors online. Without verification, these rumors would reach thousands of users immediately and cause serious damages. Many efforts have been taken to defeat online rumors automatically by mining the rich content provided on the open network. Most rumor detection methods can be categorized in three paradigms: the hand-crafted features based classification approaches, the propagation-based approaches and the neural networks approaches. This system tend to focus on the negative data problems just like the on-line rumors. Malicious rumors might cause chaos in society and sought to be blocked as soon as potential once being detected. System tend to propose a model of dynamic rumor influence reduction with user expertise. This system will help to minimize the rumor spread across the network by considering both the global popularity and individual attraction of the rumor is presented based on realistic scenario. This system will help to find the source from which rumor is being spread then delete the information which causes to mislead users. In addition of solution dynamically blocking the node which is spreading the rumor helps to improve the efficiency of the system.

Keywords: Social network, rumor blocking,

I . Introduction:

With the soaring development and rising quality of large-scale social networks like Twitter, Facebook, and Chinese Sina Weibo, etc., many numerous folks are able to become friends and share every kind of knowledge with one another. On-line social network analysis has also attracted growing interest among researchers. On one hand, these on-line social platforms give great convenience to the diffusion of positive data such as new concepts, innovations, and hot topics. On the other hand, however, they'll become a channel for the spreading of malicious rumors or

information. For instance, some folks might post on social networks a rumor regarding associate degree coming earthquake, which can cause chaos am ong the gang and thus might hinder the traditional public order. During this case, it's necessary to notice the rumor source and delete connected messages, which can be enough to prevent the rumor from any spreading. However, in certain extreme circumstances like terrorist on-line attack, it might be necessary to disable or block connected Social Network (SN) accounts to avoid serious negative influences. For instance, in 2016, the families of 3 out of the forty nine victims from the Orlando spot shooting incident filed a suit against Twitter, Facebook and Google for providing "material support" to the coercion organization of the Muslim State of Irak and Syria (ISIS). These companies then took measures to dam connected accounts, delete relevant posts and fanpages on their social network platforms to forestall the ISIS from spreading malicious information. In addition, Facebook et al. even have issued relevant security policies and standards to say the authority to block accounts of users after they area unit against rules or in danger. Without doubt, malicious rumors ought to be stopped as shortly as attainable once detected so their negative influence are often reduced. Most of the previous works studied the matter of maximizing the influence of positive data through social networks. Quick approximation strategies were additionally projected to influence maximization downside. In distinction, the negative influence diminution problem has gained abundant less attention, however still there have been consistent efforts on planning effective ways for locking malicious rumors and minimizing the negative influence. Budak et al. Introduced the notion of a "good" campaign in a very social network to counteract the negative influence of a "bad" one by convincing users to adopt the "good" one. The matter of minimizing the propagation of malicious rumors by blocking a restricted variety of links in a very social network. They provided 2 completely different definitions of contamination degree and projected corr esponding improvement algorithms. Investigated the smallest amount price rumor interference problem in social networks. They introduced the construct of "protectors" and check out to pick a least variety of them to limit the unhealthy influence of rumors by triggering a protection cascade against the rumor cascade. However, there are a few limitations in those works. First, they take into account the rumor quality as constant throughout the entire propagation process, that isn't near to the realistic eventualities. Second, in the style of the rumor interference ways, either blocking nodes or links, they fail to require into consideration the issue of user expertise in world social networks. We have to avoid interference the accounts of users for such a protracted time that they'll lodge complaints or maybe quit the social network. Therefore, it's necessary to contemplate the impact of interference time on each individual node and therefore the entire network.

I. Methods:

Paper 1: DRIMUX: Dynamic Rumor Influence Minimization with User Experience in Social Network
Author: Biao Wang, Ge Chen, Luoyi Fu, Li Song, and Xinbing Wang, Senior Member, IEEE Description: The greedy algorithm and dynamic blocking algorithm are used to minimize the rumor, which blocks the user. Intra cluster homogeneity and inter cluster diversity. It require more time to process large data

Advantage: No need of human interruption to block the user because of dynamic blocking.

Disadvantage: No particular time period is given to unblock the user

Paper 2: Limiting the Spread of Misinformation in Social Networks
Author Name: D. Agerwal, Conf.WWW,2011
Description: introduced the notion of a "good" campaign in a social network to counteract the negative influence of a "bad" one by convincing users to adopt the "good" one.
Advantage: The predictive hill climbing approach provides good performance,
Disadvantage: Our method relies on generating random spanning trees to capture

Paper 3: Blocking links to minimize contamination spread in a social network
Author Name: M. Kimura,ACM Trans. Data mining, 2013

Description: the problem of minimizing the propagation of malicious rumors by Blocking a limited number of links in a social network.

Advantage: outperform conventional link-removal methods.
Disadvantage: require more time in processing

Paper 4 : Least cost rumor blocking in social networks
Author Name: L.Fan,IEEE conf,2013
Description: investigated the least cost rumor blocking problem in social networks.
Advantage: our algorithm outperforms other heuristics algorithm
Disadvantage: they consider the rumor popularity as constant during the whole propagation process.

II. Algorithm:

1. Greedy Algorithms

Greedy is an algorithmic paradigm that builds up a solution piece by piece, always choosing the next piece that offers the most obvious and immediate benefit. So the problems where choosing locally optimal also leads to global solution are best fit for Greedy. For example consider the Fractional Knapsack Problem. The local optimal strategy is to choose the item that has maximum value vs weight ratio. This strategy also leads to global optima

2. Stop-Word Removal Algorithm

In the Information era, optimization of processes for Information Retrieval, Text Summarizing, Text and Data Analytic systems becomes utmost important. Therefore in order to achieve accuracy, extraction of redundant words with low or no semantic meaning must be filtered out.

Such words are known as stop words. Stop words list has been developed for languages like English, Chinese, Arabic, Hindi, etc. Stop word list is also available for Sanskrit language

3. Dynamic Blocking

In this paper, we investigate combining blocking and collapsing – two widely used strategies for improving the accuracy of Gibbs sampling – in the context of probabilistic graphical models (PGMs). We show that combining them is not straight-forward because collapsing (or eliminating variables) introduces new dependencies in the PGM and in computation-limited settings, this may adversely affect blocking. We therefore propose a principled approach for tackling this problem

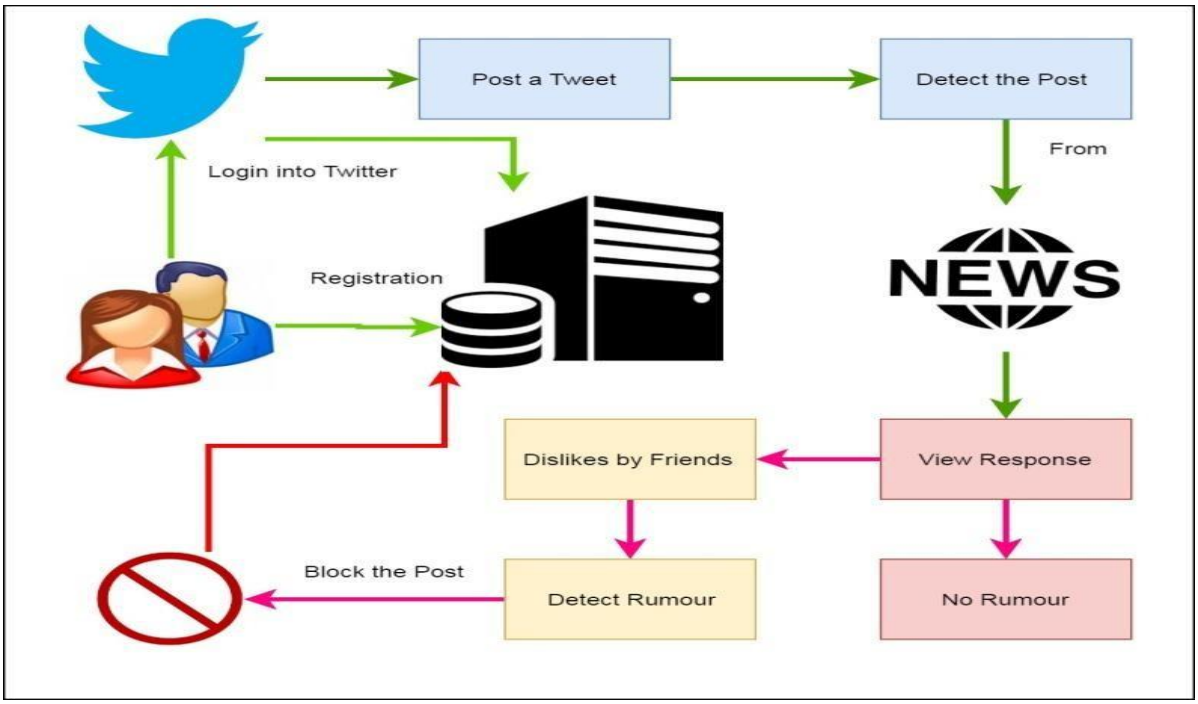
4. K-Means Clustering

K-means clustering is a type of unsupervised learning, which is used when you have unlabeled data (i.e., data without defined categories or groups). The goal of this algorithm is to find groups in the data, with the number of groups represented by the variable K. The algorithm works iteratively to assign each data point to one of K groups based on the features that are provided. Data points are clustered based on feature similarity.

III. Proposed System:

We propose the dynamic rumor influence minimization with user experience model to formulate the problem. A dynamic rumor diffusion model incorporating both global rumor popularity and individual tendency is presented. Then we introduce the concept of user experience utility and propose a modified version of utility function to measure the relationship between the utility and blocking time. After that, we use the survival theory to analyze the likelihood of nodes getting activated under the constraint of user experience utility.

Architecture Diagram



IV. Social Network Definition

A social network, in mathematical context, can be formulated as a directed graph G = (V;E) consisting of a set of nodes V representing the users, and a set of directed edges E denoting the relationship between users (e.g. following or being followed). Figure 1 shows the random graph illustration of a social network. Let jV j = N denote the number of nodes, and (u; v) 2 E denote the directed edge from node u to node v (u; v 2 V), and uv 2 f0; 1g denote the edge coefficient, where uv = 1 represents the existence of edge (u; v), and uv = 0, otherwise. We use puv to denote the probability of u sending the rumor to v and v accepting it, i.e., the success probability of u activating v. Let D(u) denote the in-degree of node u. From Figure 1, we can see nodes in larger size have higher degree than those in smaller size. The degree of a node is also an indication of "influence" in a social network since higher degree denotes more connections to other nodes, thus it implies more opportunities to share information (both positive and negative) with other nodes.

V. Rumour Diffusion Model

Rumor diffusion mechanism is similar with that of epidemic propagation. During the propagation of rumors, each node could have one of the following three states: Susceptible (S), Infected (I) and Recovered (R), which is known as the SIR model. The state of being susceptible represents the node has the potential to accept and spread the rumor at any time; Infected indicates the node has already accepted and spread the rumor; Recovered denotes the state of the node identifying the rumor and denying it. In this paper, we consider the rumor propagation as a progressive process, i.e., once a node is

infected, it will stay infected and not recover, which is the SI model.

Mathematical Model:

System S as a whole can be defined with the following main components.

S= {I, O, P, s, e, U, Uf , Ad};

S=System

U= user

Uf =Set of user friends

Ad=admin

Input{I} = {Input1, Input2},

Where,

Input1=Text

Input2=Images

Procedures {P}= {Up,Sp,Ublock,Rdetect,Rdelete}

Where,

Up=upload post.

Sp=Share Post.

Ublock= arg max [f(t1—s(t0);Ai-1) - f(t1—s(t0);Ai-1nv)]

Rdetect=åci=1åcj =1 (kxi-v jk)2

Rdelete= Delete rumour text and images

Output {O} = {Output1, Output2, Output3}

Where,

Output1=detecting rumour texts images

Output2=delete rumour texts images

Output3=block user who sent or shared rumour text and images

Initial States {s}= { initially system will be in a state where user are not enrolled, Only admin of system.}

Final State {e}= {users are enrolled and successfully post or share text or images

admin detect and delete rumour text and images and also block user who sent or shared rumour text and images }

VI. Conclusion:

In this paper, we have a tendency to investigate the rumor block drawback in social networks. we have a tendency to propose the dynamic rumor influence minimization with user expertise model to formulate the problem. A dynamic rumor diffusion model incorporating both world rumor quality and individual tendency is presented supported the Ising model. Then we have a tendency to introduce the concept of user expertise utility and propose a changed version of utility operate to live the connection between the utility and block time. After that, we use the survival theory to investigate the probability of nodes obtaining activated underneath the constraint of user expertise utility. Greedy rule and a dynamic block rule are proposed to unravel the optimisation drawback supported completely different nodes choice methods. Experiments enforced on real world social networks show the effectuality of our methodology. In our future work, we have a tendency to commit to style a lot of refined rumor block algorithms considering the property of the social configuration and node properties. We intend to separate the

whole social network into completely different communities with completely different user interests so analyze the rumor propagation characteristics among communities. We are also inquisitive about investigation the way to stop the rumor propagation effectively at a late stage.

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