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MESSAGE SOURCE IDENTIFICATION USING REVERSE DISSEMINATION PROCESS

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Abstract - Identifying message sources in social networks plays a critical role in limiting the damage caused by them through the timely quarantine of the sources. However, the temporal variation in the topology of social networks and the ongoing dynamic processes challenge our traditional source identification techniques that are considered in static networks. In this paper, we borrow an idea from criminology and propose a novel method to overcome the challenges. First, we reduce the time-varying networks to a series of static networks by introducing a time-integrating window. Second, instead of inspecting every individual in traditional techniques, we adopt a reverse dissemination strategy to specify a set of suspects of the real message source. This process addresses the scalability issue of source identification problems, and therefore dramatically promotes the efficiency of message source identification. Third, to determine the real source from the suspects, we employ a novel microscopic message spreading model to calculate the maximum likelihood (ML) for each suspect. The one who can provide the largest ML estimate is considered as the real source. The evaluations are carried out on real social networks with time-varying topology. The experiment results show that our method can reduce 60% − 90% of the source seeking area in various time-varying social networks. The results further indicate that our method can accurately identify the real source, or an individual who is very close to the real source. To the best of our knowledge, the proposed method is the first that can be used to identify message sources in time-varying social network

Terms—Time-varying social networks, message spreading, source identification, scalability.

I. INTRODUCTION

The requirements specification is a technical specification of requirements for thesoftware products. It is the first step in the requirements analysis process it lists the requirements of a particular software system including functional, performance and security requirements. The requirements also provide usage scenarios from a user, an operational and an administrative perspective. The purpose of software requirements specification is to provide a detailed overview of the software project, its parameters and goals. This describes the project target audience and its user interface, hardware and software requirements. It defines how the client, team and
audience see the project and its functionality.

II. LITERATURE SURVEY

Jiaojiao Jiang et al 2018 Studied the problem of identifying multiple diffusion sources in networks. Current techniques can detect multiple sources general networks. In this paper, we proposed using effective distance to alter the original network in order to have a clear understanding of the complex diffusion processes.

H. Vicky Zhao et al 2019 A review on the analysis of information diffusion based on evolutionary theory. People now get used to interact over social networks, and one of the most important functions of social networks is information sharing. Understanding the mechanisms of the information diffusion over social networks is critical to various applications including online advertisement and rumor control.

Marton Karsai et al 2017 The temporal variation in networks' connectivity patterns and the ongoing dynamic processes are usually coupled in ways that still challenge our mathematical or computational modelling. Here we analyze a mobile call dataset and find a simple statistical law that characterize the temporal evolution of users' egocentric networks.

Benjamin Doerr et al 2018 Understanding structural and algorithmic properties of complex networks is an important task, not least because of the huge impact of the internet. Our focus is to analyze how news spreads in social networks. We simulate a simple information spreading process in different network topologies and demonstrate that news spreads much faster in existing social network topologies.

Alireza Louni et al 2015 Studied the important problem of source localization in the context of information spreads in large social networks. Specifically, they design a Maximum-Likelihood source localization algorithm that is especially suited to large social networks.

PJ Lamberson et al 2016 This paper analyzes a model of social learning in a social network. Agents decide whether or not to adopt a new technology with unknown payoffs based on their prior beliefs and the experiences of their neighbors in the network. Using a mean-field approximation, we prove that the diffusion process always has at least one stable equilibrium, and we examine the dependence of the set of equilibrium on the model parameters and the structure of the network.

B.Aditya Prakash et al 2015 identifying the nodes from which an infection in a graph started to spread. To employ the Minimum Description Length principle for identifying that set of seed nodes from which the given snapshot can be described most successfully.

III. EXISTING METHOD :

The ubiquity and easy access of social networks not only promote the efficiency of information sharing but also dramatically accelerate the speed of rumor spreading. After finding fake messages the same fake messages spreading over the network.existing method will not eliminate fake messages.

Rumors combine the characteristics of the "word-of-mouth" spreading scheme with the dynamic connections between individuals in time-varying social networks. The existing techniques generally require firm connections between individuals (i.e., static networks) so that administrators can trace back along the determined connections to reach the spreading sources. The firm connections between users are

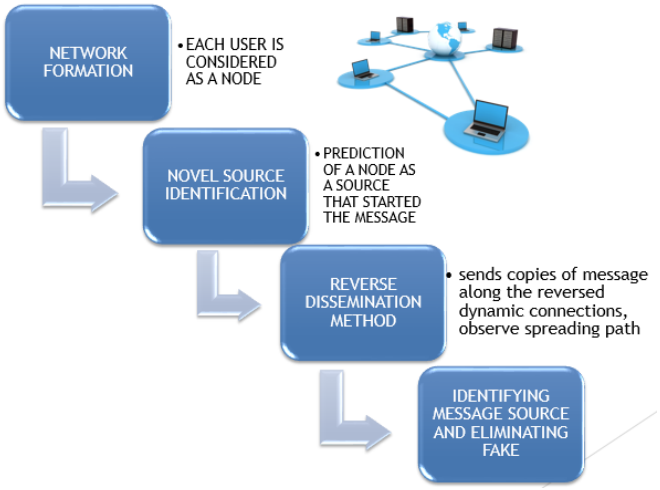
the premise of constructing spanning trees in these methods. Some other methods detect rumor sources by measuring node centralities. The individual who has the maximum centrality value is considered as the rumor source. All of these centrality measures are based on static networks. Time-varying social networks, where users and interactions evolve over time, have led to great challenges to the traditional rumor source identification techniques.

IV. PROPOSED METHOD :

In this proposed method we propose a novel source identification method to overcome the challenges. First, to represent a time-varying social network, we reduce it to a sequence of static networks, each aggregating all edges and nodes present in a time-integrating window. This is the case, for instance, of rumors spreading in Bluetooth networks, for which the fine-grained temporal resolution is not available, whose spreading can be studied through different integrating windows _t (e.g., _t could be minutes, hours, days or even months). In each integrating window, if users did not activate the Bluetooth on their devices (i.e.,offline), they would not receive or spread the rumors. If they moved out the Bluetooth

coverage of their communities (i.e., physical mobility), they would not receive or spread the rumors. Second, similar to the detective routine in criminology, a small set of suspects will be identified by adopting a reverse dissemination process to narrow down the scale of the source. The reverse dissemination process distributes copies of rumors reversely from the users whose states have been determined based on various observations upon the networks. The ones who can simultaneously receive all copies of rumors from the infected users are supposed to be the suspects of the real sources.

V. ARCHITECTURE DIAGRAM :



VI. MODULES

1. Network Formation
2. Novel Source Identification
3. Reverse Dissemination Process
4. Identifying Rumor Source and Elimination

1.*Network Formation*

In this module, we have to create simple network, we consider one social network within the network user can send anything related to politics, sports, movies, etc.this same scenario we are going to implement our project. each users consider as a node, which is having neighbors those neighbors are consider as friends and also each node having one unique number with respective unique number we can maintained the sender name in the node. The system time will continuously running in the top of the node we need to change the network from dynamic to static so we can maintained the received time for every individual by using system time.

2.*Novel Source Identification*

In this module, the essence of social networks lies in its time-varying nature. For example, the neighborhood of individuals moving over a geographic space evolves over time (i.e., physical mobility), and the interaction between the individuals appears and disappears in online social networks (i.e., online/offline). Time-varying social networks are defined by an ordered stream of interactions between individuals. In other words, as time progresses, the interaction structure keeps changing. Examples can be found in both face-to-face interaction networks, and online social networks. The temporal nature of such networks has a deep influence on information spreading on top of them. Indeed, the spreading of rumors is affected by duration, sequence, and concurrency of contacts among people. In this work, we reduce time-varying networks to a series of static networks by introducing a time integrating window. Each integrating window aggregates all edges and nodes present in the corresponding time duration.

3.*Reverse Dissemination Process*

The rationale of the reverse dissemination method is to send copies of rumors along the reversed dynamic connections from observed nodes to exhaust all possible spreading paths leading to the observation. The node from which all the paths, covering all the observed nodes' states, originated is more likely to be a suspect. The reverse dissemination method is inspired from the Jordan method. The reverse dissemination method is different from the Jordan method, because our method is based on time-varying social networks (involving the physical mobility and online/offline status of users) rather than static networks. In this process gives near to the rumor but not giving exact rumor in the social network.

4.*Identifying Rumor Source and Elimination*

In this module, another bottleneck of identifying rumor sources is to design a good measure to specify the real source. Most of the existing methods are based on node centralities, which ignore the propagation probabilities between nodes. These violate the rumor spreading processes. We adopt an innovative method to identify the real source from the suspects. A novel rumor spreading model will also be introduced to model rumor spreading in time varying social networks. Every user maintained two type of table one is received message table another one is fake message table. First table contain message, message id, sender name and time. The fake table contains fake message and respective message id and time. The fake message identified from any one of the user he/she just resend the message to sender the sender detail maintained in the table. After receiving sender the data count will be initially one he/she received the fake message from some other person which is also maintained in the user table. Again he/she resend the message to the sender and the data count will be increased this

process will continuously running until reach the real source whose having high data count he/she is the real rumor in the social network. Using this method the exact rumor will be identified and the fake message will not transfer anymore after finding the real source in the social network and rumor source will be eliminated from the network.

VII. Some Common Mistakes :

The word "data" is plural, not singular. In American English, periods and commas are within quotation marks, like "this period." A parenthetical statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.) A graph within a graph is an "inset," not an "insert." The word alternatively is preferred to the word "alternately" (unless you mean something that alternates). Do not use the word "essentially" to mean "approximately" or "effectively." Be aware of the different meanings of the homophones "affect" and "effect," "complement" and "compliment," "discreet" and "discrete," "principal" and "principle." Do not confuse "imply" and "infer." The prefix "non" is not a word; it should be joined to the word it modifies, usually without a hyphen. There is no period after the "et" in the Latin abbreviation "et al." The abbreviation "i.e." means "that is," and the abbreviation "e.g." means "for example." An excellent style manual for science writers is [7].

Acknowledgment

The preferred spelling of the word "acknowledgment" in America is without an "e" after the "g." Try to avoid the stilted expression, "One of us (R. B. G.) thanks …" Instead, try "R.B.G. thanks …" Put sponsor acknowledgments in the unnumbered footnote on the first page.

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