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PREDICTING SOCIAL NETWORK COMMUNITIES STRUCTURE CHANGES AND DETECTION OF SPAMBOTS

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Abstract - *Since evolution, many changes take place in a community of a social network. Any development or regression taking place in the community is called as a crucial event. For example, a community may expand, shrink or remain the same and may also combine with another community. Predicting the crucial events can be done by studying the evolution of the community over a period of time. This process is an important issue. In the study of social networks there is an absence of formal approaches for modeling and predicting crucial events. The Spambot detection in online social networks is the solution for the long-lasting challenge involving the study and design of detection techniques which are capable of efficiently identifying ever-evolving spammers. Recently, a new wave of social spambots have emerged, with advanced human-like characteristics that allow them to go undetected even by current state-of-the-art algorithms. In our proposed system, efficient spambots detection can be achieved via an in-depth analysis of their collective behaviors, exploiting the digital DNA technique, for modeling the behavior of social network users*

Key Words: Social network, Prediction, Spambot detection, Crucial events, Digital DNA.

1. INTRODUCTION

The goal of this paper is to automatically identify the optimal window size in order to address the drawbacks of the existing approaches. We propose a principled approach in which the optimal window size is first defined. Once the window is defined, it is then used to identify and track communities over a period of time and detect critical events that they may experience. Then the critical events are modeled as temporal equations in order to predict the future critical events based on autoregression and survival analysis theories. Our approach takes into consideration the topological features extracted from the evolving communities.

The behavioural lifetime of a digital account is encoded in a sequence of characters. Then, we define the similarity inthe digital DNA sequences. Based on the similarity between the users and the digital DNA we sort both real users and spambots. Thus, we can distinguish between the spambots and real users in both supervised and unsupervised manner. The effectiveness of Social Fingerprinting is then compared with three state-of-the-art detection algorithms.

2. LITERATURE SURVEY

[1] Microblog stages have been astoundingly occurring in the big data age because of its real time scattering of statistical data points. It's significant to recognize what peculiar occurrences are inclining on the informal organization and be able to administer their unfurling and find undifferentiated from anomalies. In this undertaking, we have built up RAMS, a genuine time emerging peculiarity overseeing plan over microblog content substance. RAMS acclimatizes our endeavor on both emerging peculiarities checking examination and framework examination. From the emerging overseeing perspective, RAMS presents a chart investigative method such that, RAMS can identify emerging oddities at an earlier stage in contrast with the current methodologies, RAMS is among the first to structure the emerging peculiarities interrelationships in a gushing way, RAMS can screen inconsistency advancements progressively at various time ranges from minutes to months. From the framework inquire about angle, RAMS improves time-ran watchword question execution of a full-content web search tool to change the capacity of emerging inconsistency advancement, it likewise upgrades the ongoing diagram creating execution of Start and instruments our chart stream demonstrate on it, As a result, RAMS can process enormous information to the whole Weibo or Twitter content stream with ceaseless level extensibility. The framework particularly shows its strength over current existing frameworks and methodologies from both the occasion checking viewpoint and the framework point of view for the emerging occasion observing venture.

[2] In the past years there was an increasing interest in analyzing social networks and modeling their dynamics at different scale. This work mainly focuses on predicting the future state of communities, where communities arise as a result of interaction between various user. We employ many structural and temporal features to represent the communities with their past form, that are used to predict whether a community will continue as they are, shrink, grow better or disappear completely. We create a real-life social network dataset consisting of posts from the mathematical stack exchange Q&A site. In this experiment special care is taken in the handling of class imbalance in dataset and in

finding out how the past of a community affects the predictions.

[3] Tracking. the changes make in the communities is presented in this paper. What makes this different from the other existing methods is that it is based on time-to-time consecutive evaluation. This approach uses a similarity measure which includes the global temporal aspect of a network under investigation process. A notable feature of this approach is that it can contain the generated content over various time points. Experiments were conducted on real data extracted from the DBLP to demonstrate the reason as to why that particular method was proposed.

[4] Community formulation analysis of dynamic networks is a hot topic in data mining. There are many studies recently which mainly focus on discovering communities from consecutive snapshots by considering both current and historic information. However, these cannot provide us with successive information related to the detected communities. The previous studies focus on community detection in dynamic network, where we define a new way of tracking the progression of the community- that reflects the robustness and coherence for the entire observation. To achieve this, we propose a framework that formulates the problem as an optimization task. In order todemonstrate that the proposed method provides precise and meaningful evolutionary patterns of communities which are not directly obtainable from traditional methods, we perform experimental studies on one synthetic and five real datasets: Social evolution, tweeting interaction, actor relationships, bibliography, and biological datasets. The obtained experimental results show that the proposed approach is highly effective in discovering the progression of community strengths and detecting interesting communities.

[5] Recommendation systems and customer targeting are some of the important applications for finding patterns of interaction and predicting the future structure of networks.Community structure of social networks are subjected to change by different temporal events and transitions. In this paper, the proposed system is a framework to predict the cases where different events and transition for communities in a dynamic social network may occur. This framework incorporates the key features related to a community –its structure, history, and influential members, and thus automatically detects the most predictive features for every event and transition. The experiments conducted with real world datasets will support that the evolution of communities can be predicted with a very high accuracy, while further observation provides that the most significant features vary for the predictability of each event and transition.

[6] Trying to predict the future direction of a community is a problem with a high theoretical as well as practical significance. It allows to determine what are all the characteristics that describes a community have importance from the point-of-view for their future. The knowledge about the future of a community will help in decisions concerning the investing in contact with members and carrying out effective steps of forming opinions or to protect a group of participants against such activities. In this paper, a new approach to predict the future events is presented along with comparison of existing methods. Experiments performed prove high quality of prediction result. When compared to the previous studies, using measures to describe the group profile and in consequence as a classifier input can improve the predictions.

[7] Structure of communities is common in various networks, algorithms for finding such communities especially in complex networks have attracted attention in recent years. We introduced a different and a new adaptive clustering algorithm that is capable of extracting modules from complex networks with considerable amount of accuracy and robustness. In this approach every single node belonging to a network acts as an autonomous agent that describes the behaviour where the vertices travel towards their preferable neighbouring groups. An optimal structure can be produced from a collection of these active nodes during self-organization process. The applications in three real-world networks demonstrate that our algorithm can find communities that are parallel with the appropriate organizations.

Table -1: Comparison Table

Author	Year	Approach	Description
M.Vidhya Sri et. al.,	2018	Index searching and keyword detection	The system detects emerging events, build event correlations and trace event evolutions.
Maria Evangelia et. al.,	2017	Many structural and temporal features to represent communities	They proposed a framework that incorporates all the necessary steps for building a predictive model to infer community evolution.
Etienne Gael Tajeuna et. al.,	2016	Preserve the generated content across different time points.	The proposed approach uses the global temporal aspect of the network under investigation.

Nan Du et. al.,	2015	Use of one synthetic and five real datasets	The proposed method provides precise and meaningful evolutionary patterns of communities.
Mansoureh Takaffoli et. al.,	2014	Microscopic approaches focusing on the evolution at the level of nodes and edges	They proposed a framework to predict the occurrence of different events and transition for communities in dynamic social networks.
Bogdan Gliwa et. al.,	2013	SGCI method for identification of groups event	They proposed a future event prediction based on stable group changes identification algorithm.
Zhenqing Ye et. al.,	2008	The modularity-oriented agglomerative clustering approaches	They proposed an adaptive clustering algorithm for module detection of complex network.

3. RESEARCH DIRECTION

Uniqueness of a human being in biological sense is defined by their DNA. A unique digital DNA contain their endless pieces of web activities. By using digital DNA, we can predict community changes and their future.

The way people interact with other accounts on social network creates a unique data trail. By using the social fingerprinting accurate identification of a user's unique account analysis and computational forensics.

4. DISCUSSION

A salient feature of our approach is the possibility to apply off-the-shelf DNA analysis techniques to study the behavior of online users and to efficiently rely on a limited number of lightweight account characteristics.

5. CONCLUSION

From this paper we infer that critical events taking place in a community of a social network is subject to undergo various changes with evolution. An important factor is that it has to be predicted to be used as a module. There are various approaches but we adopt the use of digital DNA behavioral modelling technique. Our proposed system is the use of social detection approach along with algorithmic toolbox which is expected to have detecting capabilities and thus produce excellent results.

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