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Prospect of Message Filtering Expert System in Social Network

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Abstract

In this technological era, millions of users are communicating each other with the help of Social Network which makes the globe into a small village. Though this advancement is most appreciable, at the same time it found to be more insecure too as most of the online users try to draw attention with other users in many ways, like posting irrelevant messages / pictures etc. Though Online Social Network (OSN) provides support to prevent unwanted messages on user walls, it is not sufficient to control all types of messages. Moreover, it consumes more time which is not effective compared to the present dynamic world. Researchers today are trying to develop many filtering techniques especially for keyword extraction, but not sufficient to handle all kinds of problems that are facing by normal people in OSN environment. Therefore an advanced and secure message filtering technique is very much essential in OSN.

This paper focuses on the existing message filtering techniques used in OSN and analyzes their prospects towards the prevention of unwanted messages in SN. This paper also focuses on the advantages of Expert System in this regard.

Keywords: *Online Social Network, Filtering technique, Expert System, User wall, keyword filtering*

Introduction

Social Network (SN) is a network through which one can communicate with others directly or indirectly, individually or in a group. According to M. McDowell and D. Morda, social networking is a way to connect millions of people and share information with each other online [7]. Thousands of people using this social networking service worldwide quickly. The sites like Facebook, Twitter, Instagram, LinkedIn, WhatsApp, Vine, Skype etc. are used broadly in social environment because of their bountiful advantages. In our society, different types of users use the SN in various ways. According to the statistics there are 1.28 billion users of Facebook and on an average; more than 30 billion pieces of content are shared each month [6]. Similar in the case of Twitter that comprising of 255 million users and 500 million tweets every day [20]. Among all other features, secrecy maintenance is also the most important feature in SN, which yet to solve fully. Existing technology does not able to solve all problems facing by the user in SN sites. Vulnerability has reached new heights due to the overpowering effects of Social Networking. It is seen that majority of users misuse the social network in different ways. Among the young generation users, tendency to harass other is gradually increases and they can easily mislead another user. Existing SN applications are open to all types of users and any category of users can post any types of messages to anyone. Those messages may not be suitable for all kind of users. To prevent these irrelevant messages there need to be a sophisticated and advanced filtering technique in SN sites. Because of the lack of advanced filtering technique in SN, different incidents are happening in our society in many times. Therefore, there is an urgent need to control unrelated post or messages for a specific user in SN.

Filtering Policy

Filtering process involves finding out the information that is not relevant for a user or a reader. In online communication, filtering technique is an important key factor for retrieving data or information. It makes the information more secure and can categorize the data easily.

Filtering occurs when data or information passes through an intermediary in the communication channel. All types of data or information of SN are stored in the cloud and user may access the data or information by applying various filtering approaches like data-mining, policy-based filtering, Collaborative filtering etc.

Filtering in Social Network

Filtering is one of the most important processes to collect appropriate data or information. Using filtering policy, we can easily find out the relevant information according to user's needs. When we share information between users of social networking sites, we must also follow the potential risks and we need to be wary of what we are sharing. Though researchers introduced many approaches by using different techniques in filtering key words, they are still working on this and trying to find out a best approach in SN environment.

M. Vanetti *et. al.* provided to the user a straight control over their own private wall, called Filtered Wall, to avoid unwanted messages. They introduced a complementary Blacklists (BL) management system which is the flexible mechanism to customization and used Machine Learning Techniques to generate the blacklist of the bad words and also the unauthorized users [8]. A. Kashyup, H. Kothari *et.al.* built a machine learning filtering system. They introduced a flexible rule based system that controls the messages posted on the users' wall [1].

M. Chau and H. Chen introduced two benchmark approaches called Lexicon based approach and Keyword based SVM approach for information filtering and retrieving [9].

N. J. Belkin and W. Bruce Croft has distinguished that in social filtering systems, documents are filtered based on annotations made by prior readers of the documents and filtering of unwanted information can help in reducing the risk of dispatching bad content. They used Content-based filtering technique to filter the information [10].

P. W. L. Fong and M. Anwar mapped Facebook privacy preservation mechanism into an access control model, which delineates the design space of protection mechanisms under the paradigm of access control and worked on the fact that how the model can be instantiated to express access control policies that possess rich and natural social significance [12].

J. Golbeck [5] mainly focused on privacy preserving data mining skills that is protecting information related to the social network analysis and proposed an application called Film Trust, that exploits OSN trust relationships and provenance information to personalize access to the website. However, these systems do not provide a layer of filtering policy by which the user can exploit the results of the classification process and decide how to filter unwanted information.

Text categorization and text classification is one of the most advanced text filtering approaches. Researchers developed many applications on this field. P. J. Hayes *et.al.* explained that a text-categorization application developed with TCS (text categorization shell) consists of the TCS run-time system and a rule base. The rule base defines what categories the application can assign to texts and contains rules that make the categorization decisions for particular texts [13]. J. Platt, S. Dumais *et.al.* compared the effectiveness of 5 different automatic learning algorithmic

rules for text classification in terms of learning speed, real-time classification speed and classification accuracy. They concluded in their paper that the Linear Support Vector Machines are most accurate classifier, fastest to train and quick to evaluate [6]. S. Zelikovitz and H. Hirsh attempted to improve the classification of short text strings for developing a semi supervised learning strategy which is based on a combination of labeled training data and a secondary corpus of documents [17]. R.E. Schapire and Y. Singer described an application called BoosTexter, which consists of boosting algorithm for text classification tasks and also they compared its performance with a number of other text-classification algorithms on a Flavour of tasks [14]. V. Bobiecev and M. Sokolova proposed a different approach that bypasses the problem of the construction function of errors by adopting a statistical learning method that is used in probabilistic classification of text [19].

The existing system has policy based frameworks KAoS and REI[11] which supports the specification and enforcement of constraints for the machine resources provides a support and to trust negotiation and privacy policies, and WIQA[2], which enables end users with the ability of using filtering policies which gains a quality demanded by the user from web resources.

From the above study we have seen that researchers mainly working on classification and categorization of texts for filtering data in social network environment. But controlling of unwanted messages is not getting much demand among the researchers. They are not concentrating on automatic filtering of unwanted messages which may be the great demand in near future. Because of the huge and continuous flow of unwanted messages on a user's social network, there may be lots of problems in his/her day-to-day work. The existing filtering techniques so far do not have the capacity to work as an automatic decision support system that can take decision dynamically for the user. Therefore, a dynamic decision making mechanism to control unwanted information is one of the challenges in SN. Also researchers should focus on consumption time in filtering process so that it will take less time than exiting filtering techniques.

ES in Message Filtering:

As ES works automatically without direct human intervention, it can take an important role in message filtering in SN. It can automatically find out unwanted keywords, without direct human interaction, based on annotations made by past history of the user's interest. As users of SN are of different types and of different categories, the system also have to take decision separately for each user and to take decision expertly for each and every user separately and differently, an ES will be the best technology. ES can work on this current aspect and will control unwanted messages as per the need of the user. An expert system is a computer program that works in accordance with human expertise and can solve problems, can give advice in a specialized domain area. It operates as an interactive system to respond questions, asks for clarification, makes recommendations, and generally aids the decision making process [13]. ES provides expert advice and guidance in a wide variety of activities, from computer diagnosis to delicate medical surgery. Instead of simply manipulating data sets, an ES can draw a conclusion which is the main advantage and difference from traditional

database programs [3][4]. It contains both declarative and procedural knowledge. An ES has reasoning capability to arrive at conclusions from stored and supplied facts. The basic advantage of using such Expert Systems is that there is no restriction on input data on their limits and the data not necessarily defined clearly in advance. It can give several alternative solutions; either ranked or unranked [15].

In dynamic world, as the number of user increases, the technology should be enhanced for better communication over the network and take quick decision expertly in specific domain area. In SN different category types of user is trying to communicate with every nearby user and a single user could not able to point out the intention of that particular user. It is seen that a huge number of users make them always online on SN and tries to communicate with others [4]. huge number of users is posting with an abusive word in every second into a particular user in an irritating way and he/she is not possible to block all the users manually. It requires more time, even in a life time no one could complete the blocking process about that fraud users. In that case question may arise, how can we overcome from that type of problem? Therefore Golbeck enhance the study for applying a new filtering technique embedded to it, is called ES [5]. Experimentally evaluate an automated system, ES able to filter unwanted messages from OSN user's walls and automatically block the user's profile depending upon Knowledge Base (KB) and Inference Engine (IE). ES technologies and tools are more attractive and interactive because ES technology can work according to human expertise [6], can solve problems and can give advice in a specialized domain area [18] [16]. The study strive to develop and implement an ES which will intelligently and dynamically undertake web content filtering to prevent the misuse of internet and reduce the fraud level upto an user satisfying level. It also will serve for proper utilization of social network.

Conclusion

After the study by comparing the existing systems we are coming to the conclusion that for controlling the unwanted posts in the SN environment, ES will be the best possible solution, which can prevent all those in an expert manner. With this technology the problems that facing by the general people in SN can also be solved and users can use their sites confidently.

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